THE

AMERICAN GAS-LIGHT JOURNAL

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

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CANNEL AND ORREL GAS- Coal.—The Subscribers are constantly receiving direct, from the celebrated mines of WILLIAM H. BRANKER & CO., NEWCASTLE, ENG., COAL of the very first quality for gas purposes, which they will sell direct from ship or from yard at the lowest market price; and we guarantee the coal to be equal if not superior to any other coal brought to this market.

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THOMAS GLOVER'S Meters have now been in use in the United States and British Provinces, for the last FOURTEEN YEARS, and are extensively used by many Gas Companies, to their entire satisfaction; and R. GLOVER can with all confidence, refer to them in proof that THOMAS GLOVER'S Meters are—the most PERFECT in PRINCIPLE—the most CORRECT in REGISTRATION—and more DURABLE than any other Dry Gas Meter made in the United States or Great Britain. R. GLOVER will at all times be glad to repair any Gas Meters sent him at the above factory. If any of them are of THOMAS GLOVER'S manufacture, and of a more recent date than THREE years, he will make no charge.

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*The standard of measurement of this Gas-Holder is given by Professors TORREY, of the U. S. Assay Office; JOY, of Columbia College; GIBBS, of the Free Academy and several other distinguished scientific gentlemen.

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The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. Messrs. J. LENNIG & Co. confine their sole attention to the business of GAS-METER making.

Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers.

Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us. ☞ Each Meter Tested Separately by a Sworn Inspector, and Sealed when desired. ☜

METERS REPAIRED AND FORWARDED WITH DISPATCH.

WHERE GAS-WORKS AND WATER-WORKS ARE WANTED.

We are now publishing regularly the names of the thirty thousand post-towns in the United States, so that builders of gas-works and water-works, and the various manufacturers may see where are new openings for business. And as each post master will receive several copies of the AMERICAN GAS-LIGHT JOURNAL, for distribution, the number thus circulated will probably exceed *Three Million Copies. What a chance for advertisers!*

POST-OFFICE TOWNS IN THE UNITED STATES.

ARRANGED BY STATES AND COUNTIES,

Shewing where Gas-Works and Water-Works are Wanted.

GEORGIA.

152 Counties, 485 Towns, 6 Gas-Works, 2 Water-Works.

(*Concluded from page* 199.)

Lowndes County.

Anderson, Griffin's Mills, Piscola,
Ava, Hahira, Radford's Mills,
Clyattsville, Morven, Tallokas,
Flat Creek, Okapilco, *Troupville*, (c. h.)
Grand Bay,

Lumpkin County.

Amicalola, Crossville, Pleasant Retreat,
Auraria, *Dahlonega*, (c. h.,) Round Hill,
Barrettsville, Juno, Smithville,
Catoosa, New Bridge, Yellow Creek.

MacIntosh County.

Darien. (c. h.,) Johnston's Station. South Newport,

Macon County.

Creek Stand, Hamburg, Montezuma,
Etna, *Lanier*, (c. h.,) Oglethorpe,
Grangersville, Marshallsville, Winchester.

Madison County.

Brookline, Fort Lamar, Paoli,
Danielsville, (c. h.,) Madison Springs, Planter's Stand.

Marion County.

Buena Vista, Glenalta, Poindexter.
Church Hill, Pine Knot Mills, *Tazewell*, (c. h.)
Fragoletta, Pineville,

Meriwether County.

Erin, Jones' Mills, Warm Springs,
Farmer's, Magdalena, Warnerville,
Flat Shoals, Oak Ridge, White Sulphur Spr'gs,
Greenville, (c. h.,) Rocky Mount, Woodbury.
Holly,

Miller County.

Colquit.

Milton County.

Alpharetta.

Mitchell County.

Camilla, Gum Pond, Viola.

Monroe County.

Colaparchee, Johnstonville. Russellville,
Culloden, New Market, Unionville.
Forsyth, (c. h.,) Proctor's Store,

Montgomery County.

Boxville, Little York, Seward,
Hot House, *Mt. Vernon*, (c. h.,) Sterling.

Morgan County.

Buck Head, Fair Play. *Madison*, (c. h.)
Ebenezer, High Shoals, Rutledge.

Murray County.

Chaseville. Fancy Hill, *Spring Place*, (c. h.,)
Cohuttah Springs, Hassler's Mills, Woodlawn.
Coosawattee, Holly Creek,

Muscogee County.

Columbus. (c. h.,) Steam Factory, Water Oak.
Jamestown, Upatoie.

Newton County.

Brick Store, Newborn, Rocky Plains,
Conyers, Newton Factory, Sheffield,
Covington, (c. h.,) Oak Hill, Snapping Shoals,
Middle Ridge, Oxford, Starrsville.

Oglethorpe County.

Bairdstown, Maxey, Point Peter,
Crawford. Millstone, Stephens.
Lexington, (c. h.,) Philomath,

Paulding County.

Dallas, (c. h.,) Drake Town. Huntsville,
De Soto, Etna, Pumpkin Vine.

Pickens County.

Jasper, (c. h.) Marble Works, Saunder's Town.
Jerusalem, Rich Mountain, Ta king Rock.

Pierce County.

Blackshear, Zero.

Pike County.

Barnesville, Liberty Hill, *Zebulon*, (c. h.)
Griffin, Milner,

Polk County.

Cedartown, Pumpkin Pile, Yellow Stone.
Esom Hill, Van Wert,

Pulaski County.

Cross Creek. Lawson, Long Street.
Hawkinsville, (c. h.,)

Putnam County.

Avlona, *Eatonton*, (c. h.,) Rockville,
Clopton's Mills, Glades Cross Roads, Stanfordville.
Dennis, Hearnville.

Rabun County.

Clayton, (c. h.,) Pine Mountain, War Woman.
Head of Tennessee, Tiger,

Randolph County.

Benevolence. *Cuthbert*. (c. h.,) Nochway,
Brooksville, Georgetown, Odchodkee,
Buford, Hamlet, Verona.
Cotton Hill, Linwood,

Richmond County.

Allen's, Belair, Richmond Factory.
Augusta, (c. h.,) McBeen Depot,

Scriven County.

Black Creek, Middle Ground, Ogeechee,
Buck Creek, Mill Haven, Scarborough,
Halcyon Dale, Mobley Pond, *Sylvania*, (c. h.)

Spaulding County.

York.

Stewart County.

Bladen Creek, Friendship, Millard,
Compton, Hannahatchee, Richland,
Florence, *Lumpkin*, (c. h.,) Scienceville.

Sumter County.

Americus, (c. h.) Danville, Pondtown,
Andersonville, Lake Harris, Providence,
Bottsford, Plains of Dura, Quebec.

Talbot County.

Belleview, Geneva, Quito,
Bluff Spring, Pleasant Hill, Red Bone,
Box Spring, Prattsburgh, *Talbotton*, (c. h.)
Centre,

Taliaferro County.

Crawfordsville, (c.h.,) Rayton, Sharon.

Tatnall County.

Bull Creek, Matlock, Reidsville,
Long Branch, *Perry's Mills*, (c. h.,) Watermelon.

Taylor County.

Butler, (c. h.,) Howard, Reynolds.
Daviston, New Agency,

Telfair County.

Cobbville, Lumber City, Sugar Creek,
Copeland, McRae's Store, Temperance.
Jacksonville, (c. h.,)

Terrell County.

Chenuba, Dover, Oceola.
Dawson,

Thomas County.

Arabia, Eastwood, Tatesville,
Boston, Glasgow. *Thomasville*, (c. h.,)
Dry Lake, Grooverville, Youngsville.
Duncanville, Station,

Towns County.

Hiawassee, (c. h.,) Mountain Scene, Mount Eolia.

Troup County.

Antioch, Long Cane, Troup Factory,
Ashbury, Mountville, Vernon,
Hoganville, O'Neal's Mills, West Point.
La Grange, (c. h.,)

Twiggs County.

Jeffersonville, Tarversville, Twiggsville.
Marion, (c. h.,)

Union County.

Blairsville, (c. h.,) Ivy Log, Stock Hill,
Brasstown, Mill Creek, Track Rock,
Choestoe, Rose Hill, Young Cane.
Gaddistown, Shady Grove,

Upson County.

Double Bridges, *Thomaston*, (c. h.,) Thundering Springs,
Flint River Factory, The Rock, Waynmanville.

Walker County.

Cane Creek, Frick's Gap, Pond Spring,
Cassandra, Greenbush, Rock Spring,
Catoosa Springs, High Point, Rossville,
Cedar Grove, *Lafayette*, (c. h.,) Snow Hill,
Chestnut Flat, Naomi, Villanow.
Duck Creek,

Walton County.

Cut Off, *Monroe*, (c. h.,) Walnut Grove,
Good Hope, Social Circle, Windsor.
Loganville,

Ware County.

Burrell, Kettle Creek, *Waresboro'*, (c. h.)
Isabel, Strickland's,

Warren County.

Double Wells, Mayfield, Tannville,
Jubilee, Republican, *Warrenton*, (c. h.)

Washington County.

Curry's Mills, Irwin's Cross Roads, Tennille,
Davisboro', Oconee, Warthen's Store.
Hebron, *Sandersville*, (c. h.,)

Wayne County.

Bennettsville, Satilla, *Waynesville*, (c. h.)
Doctor Town,

Webster County.

Preston, Weston.

Whitfield County.

Anderson, Green Woods, Tunnell Hill,
Dalton, Red Clay, Upper King's Bridge,
Fillmore, Rural Vale, Varnell's Station.
Gordon Springs, Tilton,

Wilcox County.

Adams.

Wilkes County.

Centreville, Delhi, Rehoboth,
Danburgh, Mallorysville, *Washington*, (c. h.)

Wilkinson County.

Cool Spring, McIntire, Stephensville,
Gordon, Milton, Toombsborough.
Irwinton, (c. h.,)

Worth County.

Bloomfield, Deer Land, Minton,
Brooks, *Isabella*, (c. h.,) Warwick.

COAL-OIL.—We have before noted the progress of the discoveries of Petroleum in Western Pennsylvania, and descanted upon their present and prospective importance, to the neglect, perhaps, of an equally important subject, the manufacture of oil from cannel coal. Although those engaged in this enterprise have not been "hiding their light under a bushel," they have been quietly at work, and there are now many coal-oil establishments, which have recently sprung up in our midst, that are doing a large business. Lest the good qualities of this coal-oil should be forgotten or overshadowed by the speculative excitement in carbon oil, we wish to call attention to the relative merits of the two articles. For this purpose we select the Lucesco and North American Coal-Oil Companies, which have been in operation a year and a half—turning out immense quantities of oil. Both companies are composed mainly of Pittsburg capitalists, and much of the products of their works are brought to this city. Both establishments are situated about thirty miles up the Alleghany. The Lucesco works are located on the river opposite Freeport, where quite a town has been built up, consisting of a store and some thirty dwelling houses, for the hands employed at the works, numbering one hundred. The buildings occupy a large area of ground, and the company has several hundred acres of coal land, with innumerable veins of cannel coal running through it, from which an inexhaustable supply of the raw material necessary for conducting the business can be obtained. Bituminous coal, which is used as fuel, is also abundant on their lands. The Lucesco Company employ ten of Alter & Hall's revolving retorts, and a sufficient number of stills for turning out 1,200 to 1,500 barrels per month of once distilled oil, which is about the average monthly product, being equal to 1,600 to 2,000 barrels of crude oil. The North American Company produce about the same quantity monthly, but all their oil is sold in the crude state, or after its first distillation. The Lucesco Company refine a large portion of their product, and have a converting capacity almost equal to the entire product of the works. To change the oil from its crude state into that in which it is retailed to consumers for the purposes of illumination, requires three distillations, and, in addition, some chemical processes. The Lucesco Company have succeeded in producing a superior article of oil, of which we have seen and burned a sample. It is almost free from odor, and that agreeable rather than otherwise, is limpid and transparent as water, with a straw-colored tinge, and burns with a clear, steady flame, giving a light almost as brilliant and more innoxious than gas. The relative value of coal and carbon oils, for illumination, is, in view of the recent discoveries of the latter, and the quantities which will soon flood our market, a matter of interest in this community.

It is claimed that coal-oil, while giving an equally brilliant light with carbon oil, is slower of combustion, and consequently, more economical. A gentleman, thoroughly conversant with the chemical properties of both, has recently made some experiments with the oils and gas, the result of which is, one pint of coal oil, with a small chimney upon the lamp, will burn twenty hours, while the same lamp will consume, in the same time, one and one-third pints carbon oil. The quantity of gas consumed in the same time was one hundred feet. The cost of the coal-oil, at the present retail price, would be ten cents; of the carbon oil, thirteen and one-third cents, and of the gas (cheaper here than in any city in the world), fifteen cents. Thus, it will be seen, that coal-oil is one-fourth cheaper than carbon oil, and one-third cheaper than gas. As it is believed that coal-oil can be produced at a cost equally as low as carbon oil, however spirited the competition, or abundant the natural supply of petroleum, this fact gives a great advantage to coal-oil in the eyes of every consumer. The present wholesale price of coal-oil is sixty cents per gallon for refined, and twenty-six cents per gallon for crude. In our opinion, no better nor cheaper light than good coal-oil can be produced, and the fact that this is the centre of the trade, is an important one for Pittsburgers. It was thought that the carbon oil discoveries would hinder the business of its production, but, as yet, it has had no perceptible effect, the sales being constantly on the increase —*Pittsburg Post.*

SANDWICH, MASS.—Private works, built for the Boston and Sandwich Glass Company, supplying, however, a few stores and private houses near the factory.

PITTSFIELD, MASS.—L. Benedict's works, with iron retorts, Down's meters, and Smith's gas-holder. Pittsburg coal, costing $9½ per ton is used. The gas is reported to be of 15-candle strength, although no photometer is in use. Four miles of mains laid, of 3 to 8 inches diameter.

EXTENT OF SEWERAGE IN CHICAGO.—They have in Chicago forty-six and five-eighths miles of sewers—of which six miles have been laid in 1860. Of these forty-six miles, 104,458 feet are in South Chicago. 67,357 feet in North Chicago, and 66,479 feet in West Chicago. The sewers vary from one foot to six feet in diameter. There are 1,824 man-holes for entering them. The total indebtedon account of this work to date is $656,924 24.

OTTAWA, ILL.—Charles Herrick & Co., builders of the gas-works; pyro-clay retorts, from Thomas Hoadley, Cincinnatti, O; William Coggswell's iron retorts; Code, Hopper & Gratz' meters, and George Stacey's gas-holder. Length of mains 5 miles, 2½ to 6 inches diameter. Use Illinois coal at $2 50 per 2000 lb. (cheap enough, almost). Gas made in 1859, say 3,250,000 cubic feet.

THE ROCK OILS OF OHIO.

BY J. S. NEWBERRY.

The mineral oils which have of late attracted so much attention in different parts of our country, and have assumed so important a place in the resources of Ohio, are not new substances to science, the arts, or even commerce. Under the names of "Seneca oil," "Barbadoes tar," "Naptha," &c., the different forms of Petroleum have long been known, and extensively employed, especially in medicine, and will be found described in most treatises in chemistry and mineralogy.

In larger or smaller quantities, Petroleum has been found in all countries, but hitherto in the greatest abundance in California, Trinidad, Persia, Circassia, and India. A district a few miles in extent in the latter country contains over five hundred wells, which yield more than 400,000 hogsheads of oil annually. It is there used for fuel, light, and painting.

In the United States, oil springs were discovered in many localities by the first settlers; and the existence of those on Oil Creek, in Pennsylvania, and those of Northern Ohio, which have recently become so famous, has been well and widely known for half a century. It is only lately, however, that the value or abundance of the material which they supply has been suspected.

The discovery of a mode of distilling oil from coal seemed to have furnished us the cheapest good illuminator that could be hoped for. Opening, as it did, a new and wide field for the industry and enterprise of the citizens of a State so rich in coal as ours, the number of those who engaged in the manufacture of coal oil was soon considerable, and the capital employed large. As safe and certain, pecuniarly, as this scheme for extracting oil from coal seemed to be, it was destined in a few months to be overshadowed by a new growth, sprung from the seeds of its first fruits. Most naturally—but with very unexpected results—the attention of chemists and refiners of the crude oils derived from coal, was turned to those which, distilled in nature's laboratory, issued spontaneously from the earth. It was already known to some, and soon ascertained by all, that these "natural oils," by a simple and inexpensive distillation, would yield a large per centage of a liquid fully equal in illuminating power to the best oil derived from coal—in a great degree free from the objectionable odor of coal oil, and less liable to smoke.

Still, the quantity of petroleum attainable seemed quite too small to permit the hope that the enormous consumption of burning fluid could ever be supplied from that source. The spontaneous flow of oil from springs, in the aggregate amounted to but few gallons yearly; and the salt wells, in many of which petroleum existed—but only as a neglected and often troublesome product—furnished a wholly inadequate quantity.

The salt wells, however, suggested to a thinking mind the effort to procure the oil as a distinct and independent object. To Col. Drake, of Titusville, Pa., we owe the demonstration of the practicability of obtaining large quantities of petroleum from holes drilled in the rock for that purpose. It required unusual boldness and energy to go into a new field, to sink the well, to procure and set up the engine, in the face of general incredulity and much ridicule, led on by the hope of pumping up a remunerative quantity of oil from the narrow orifice of a four-inch drill hole. That scheme, though bold, was, as everybody knows, not a vain and fruitless one; but the courage and perseverance which conceived and and executed it is resulting in wealth, not only to the pioneer in the enterprise, but to many others who have followed his lead. Already the amount of petroleum daily drawn from the wells bored to procure it in Pennsylvania and Ohio, may be safely estimated to be at least five hundred barrels; and the business of raising it is only in its infancy.

Covering so wide a range of uses as this oil does, and produced so cheaply, it seems destined to supersede a large part of the oils, both animal and vegetable, now consumed in the country, and to become a most important element in the resources of our State and the revenues of our people. As such it claims something more than the historical notice I have given of it; and even demands as full a description of its character, uses, modes of occurrence, and processes of manufacture, as may be given in the present state of knowledge—such, indeed, as will best enable our people to discover and make available all the depositories of this useful article which exist within the limits of our State. Nothing like a full exposition of this subject can be compressed, however, into the space which propriety assigns to this article, in the circumstances of its publication. I shall confine myself, therefore, to the briefest possible sketch of it under the different heads enumerated above.

Nature and Origin of Petroleum.

Petroleum is the common name for mineral oil, whatever its color or consistence. These vary greatly: sometimes it is dark, viscid, and tar-like; from other localities, almost transparent, very fluid, and volatile. More generally it has an oily consistence, a brown or greenish color, and a strong characteristic odor. It may be regarded as a compound of several of a large group of bituminous substances, which differ much in their physical characters, while they present a striking similarity of chemical composition. Of these, the two extremes—Asphaltum, a hard, black, solid, and Naphtha, an exceedingly light, volatile and transparent fluid—exhibit a marked contrast of form, yet they, as well as all the intermediate members of the series are composed almost entirely of carbon and hydrogen. These hydro-carbons are considered by all chemists to be of organic origin—that is, to be derived from the decomposition of vegetable or animal tissue. Ordinary coal, which may be included in the same category, is of purely vegetable origin, while some cannels and bituminous shales contain a portion of animal matter. Petroleum has usually been produced from bituminized plants, but those varieties of it which are obtained from rocks filled with animal remains—as highly fossiliferous limestones—and which have a peculiarly strong and disagreeable odor, in virtue of the sulphur and nitrogen which they contain, are probably for the most part of animal origin.

The precise process by which petroleum is evolved from the carbonaceous matters contained in the rocks which furnish it, is not yet fully known, because we cannot in ordinary circumstances inspect it. We may fairly infer, however, that it is a *distillation*; though generally performed at a low temperature.

We know that vegetable matter—and the same may be said of much animal tissue—when the conservative influence of *life* has ceased to act, if exposed to the action of moist air, is completely disorganized by a process which we call decay, which is in fact a combustion or oxydation. This change takes place slowly, and without the evolution of light and heat—the usual accompaniments of combustion—in a degree appreciable by our senses. Chemically it consists in the union of the oxygen of the air with the carbon, to form carbonic acid—with the hydrogen to form water, carburetted hydrogen, &c. Sulphur and nitrogen, when present, are given off in sulphuretted hydrogen and ammonia.

When, however, carbonaceous organic tissue is buried in moist earth, or submerged in water, oxydation does not at once ensue or at least takes place to a limited extent, measured by the quantity of oxygen present. In these circumstances *bituminization* takes place. This process consists mainly in the union of hydrogen, from the tissue itself or its surroundings, with a portion of its carbon, to form carburetted hydrogen—which perhaps escapes—and the hydro-carbons constituting the bitumen, which usually remains as a black, pitch-like mass, investing the fixed carbon. By this process peat, lignite and coal are formed, which are solids, and doubtless also some liquid and gaseous hydro-carbons which escape. When now we heat these solid bitumens artificially, at a sufficiently high temperature, if in contact with oxygen, combustion ensues, and water and carbonic acid are formed from them. At a lower temperature they are converted into gaseous hydro-carbons; still lower to oils. What we thus do by art rapidly, nature does as effectually when left to herself, but very slowly.

We throw a piece of dry wood into the fire. In a few minutes it has run through all its changes and, as we say, it has been consumed. Exposed to the action of the "elements," the same result would be reached in ten or twenty years. Buried under earth or water where oxygen was wholly excluded, and millions of years would find it still in the bituminous stage—its constituents having reacted on each other; and produced a complete change of physical characters, but almost without loss or gain. Exposed to the action of the atmosphere again, spontaneous combustion again commences, and progresses—though more slowly than at first—till complete oxydation has been effected. Coal, when exposed to the air, is slowly oxydized, as we know by examining the out-crop of a coal seam. The extreme edge of the stratum is almost wholly decomposed, resembling rotten wood. Thence to the point where atmospheric influences are not felt, a progressive change is noticeable, both physical and chemical; the oxydizable constituents constantly increasing with its firmness and brilliancy.

That which is true of combustion may also be said of distillation—or a change from a solid to a liquid, and thence to a gaseous form without oxydation. These changes in the hydro carbon solids are but necessary preparatory steps in the process of their combustion. By the application of heat we produce them at will, and rapidly. They also take place spontaneously but slowly. Carburetted hydrogen is rapidly produced from bitumenous substances by artificial dry distillation. So it is evolved in nature, at low temperatures from submerged (and doubtless emerged) vegetable matter. It is also thrown off in immense quantities by the spontaneous distillation of bituminous coal in mines. Doubtless the same is true of the *liquid* hydro-carbons. Though less observable than than the gases, I think they may often, if not always, be detected among the products of decomposition of submerged vegetable tissue. This, at least, we may safely affirm: that their spontaneous production on a large scale in nature may generally be traced to extensive accumulations of bituminized vegetation from which they have been derived. From this they are evolved by a kind of distillation, which differs from our artificial process in wanting (in many cases at least) the condition of high temperature, but including the perhaps no less potent elements of time and pressure.*

The Distribution of Petroleum.

A knowledge of where and how rock oil occurs in nature will be a useful guide to the repositories of it, which, without doubt, exist, though still unknown, within our State limits. I have already briefly alluded to its general distribution over the earth's surface, and to the great quantities of it obtained from the shores of the Caspian Sea, the banks of the Irriwady, &c. It is also found in various parts of Europe, where it has long been made an article of commerce. The New World furnishes it in still greater abundance, and the most remarkable accumulations of petroleum and asphaltum known are those of the Island of Trinidad, West Indies, and of the southern coast of California. In Canada West are springs from which enormous quantities of petroleum issue; of which, however, the value is impaired by its almost insupportable odor. Within the limits of the United States, it occurs on the shores of Seneca Lake, N. Y.,—whence the name of "Seneca Oil," which has been given it—in Albany, Cayuga, and several other counties in the same State; in many localities in northwestern Pennsylvania, western Virginia, in Kentucky, Illinois, &c., &c. In Ohio, it has already been found in Noble, Adams, Franklin, Medina, Lorain, Cuyahoga, Trumbull, Mahoning, and other counties, and will doubtless be hereafter discovered in many places where it is not now known to exist.

Petroleum occurs in the sedimentary rocks of all ages, from the drift deposits to the base of the fossiliferous series; wherever, indeed, there is carbonaceous matter from which it could be formed. In Gneiss and Mica slate it is also sometimes discovered, but only in such as are evidently of metamorphic character. The great bituminous springs of California and the West Indies issue from Tertiary rocks; which also contain beds of lignite. Here volcanic agencies have, at a recent period, been in intense action, and the bitumen is apparently distilled from the lignites by subterranean fires. In our more immediate vicinity, the oil springs are mostly confined to the upper Devonian rocks, and in Ohio this is emphatically the oil horizon.

Some of the petroleum from the area of the Alleghany coal fields in Pennsylvania, Ohio, Virginia and Kentucky, issues from the coal measures, but most of the salt wells, from which the oil is pumped, in the Kanawha region and along the Ohio and Alleghany rivers, though begun in the coal series, reach down to and often through the conglomerate; so that in these cases also the oil is perhaps derived from the Devonian rocks. A few words on the general geological structure of Ohio will, I think, make the relative position of the oil-bearing rocks understood by all.

The productive *coal series* occupies the south-eastern third of the State. Immediately beneath this group of rocks lies the *carboniferous conglomerate*—a coarse sandrock, containing quartz pebbles. This has a thickness of from 25 to 300 feet, becoming thicker northward, and comes to the surface in a margin of varying width all around the edge of the coal basin. Under the conglomerate, we find a series of clay-shales and fine-grained sand-stones—the equivalents of the *Chemung* and *Portage* rocks of the New York geologists—the Waverly series of the Ohio reports—which form the upper members of the Devonian system. These are the *oil rocks*. They come to the surface in a narrow belt extending from Portsmouth on the Ohio nearly northward to the vicinity of Lake Erie on Huron river; thence stretching eastward parallel with the lake shore into Pennsylvania and western New York.

Below the Waverly series is a heavy bed of bituminous shale, 200 or 300 feet in thickness, called in Ohio the *Black Slate*, the equivalent of the *Hamilton Shales* of New York. This group contains an immense amount of carbonaceous matter; and oil is often disseminated through it. Sometimes it runs out in springs; but the rock is so close that neither oil nor water can flow through it, except in the somewhat rare fissures which penetrate it. The oil springs of Canada West issue from the Hamilton group. Below the Hamilton Shales is the *Cliff Limestone*, also Devonian, which forms the surface rock, over most of the western half of the State. This is a marine deposit, generally a very pure limestone, containing myriads of organic remains. In some localities the "Cliff" contains petroleum in cells or cavities. It is very dark, has a strong, disagreeable smell, contains sulphur and nitrogen, and is probably of animal origin.

The *Blue Lime stone* series—of Silurian age—which underlies the "Cliff," and is exposed about Cincinnati, has not, to my knowledge, yielded any considerable quantity of petroleum.

I have said that the Waverly series—or the Chemung and Portage rocks—are *the* oil rocks of Ohio. By this I mean that they are the principal repositories of oil—the source from which we are mainly to derive the millions of gallons which will be annually used in or exported from the State—the geological level along which we must look for new discoveries of petroleum.

That the oil *originates* in this group of strata is, however, by no means certain. On the contrary, it seems more probable that it merely accumulates in them, as a convenient reservoir, when flowing from another source. These rocks are mechanical sediments, and are, in Ohio, generally destitute of organic remains, whether animals or plants. They are, however, often quite porous, and strong currents of water flow through them. The Hamilton Shales, on which they rest, contain an amount of carbonaceous matter probably equal to all that included in the coal measures. Here, I suspect, most of the oil originates. From this bituminous mass, as distilled by nature's processes, it would rise through every fissure by the pressure of the incumbent rocks, or water, which is specifically heavier. A few layers of the Waverly series are highly charged with the debris of vegetables and marine shells; and these may generate some oil; but for the most part what they contain is of foreign origin. The source to which I have referred it is so entirely sufficient, both as regards its position and character, that it seems

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* The marked and almost constant companionship between petroleum and salt water, has suggested the thought that the chloride of sodium may have had some chemical action on the bituminous matter favoring its production.

The facts that when distilled with a strong solution of sea salt, petroleum readily yields a large part of its naphtha, and asphaltum a portion of its petroleum, (Huguenet, *Asphaltes et Naphtes*, pp. 66, 67, 214,) seem also to favor this hypothesis. It remains to be proven, however, that this action can take place in nature's laboratory at low temperatures—for it seems really necessary in some cases that the theory of the formation of petroleum should not include the element of extreme heat.

unnecessary to look farther.* Over nearly all the northern part of the State, where the Portage and Chemung rocks are exposed, petroleum may be found exuding them in greater or less abundance; but it is only at comparatively few points that it is found in a "paying" quantity.

The Oil Creek region in Pennsylvania is one of these series of oil centres. There the wells are sunk from 70 to over 300 feet—often to, and sometimes apparently through the Portage group. The oil occurs at all depths. It is frequently found saturating the surface deposits, and the deepest bore has not reached beyond it. It flows in fissures with water, and that from neighboring wells differs much in quality: all of which facts seem to indicate that it is derived from a somewhat remote source below. The oil of Titusville is very thin, varying shades of brown in color, and has a specific gravity of 35° to 40° Beaume.

Not very far distant from the Oil Creek district is that of Mecca, Trumbull county, Ohio. Here some 200 wells are being bored, and a dozen or more have been successfully pumped. The geological level of the Mecca wells is the same as that of Titusville, but they are generally less deep; varying from 30 to 200 feet, while most are about 50. The rock is a soft bluish-white sand-stone, with partings of clay-shale, sometimes quite saturated with oil. The yield of the wells is from 5 to 20 barrels each per day. The oil is much thicker than that of Pennsylvania, has a greenish brown color, and comparatively little odor. Its specific gravity is from 28° to 30°. For many miles around Mecca signs of oil are found—in the wells sunk for water on the surface of streams, &c.—and the aggregate production of oil from that district will unquestionably be very large.

At Lowellville, Mahoning county, thirty miles southeast from Mecca, a single well has been bored to the depth of 157 feet, and it is said to be now yielding some 20 barrels of oil per day. This well is sunk through the conglomerate, which is there thin, and into the Chemung. The oil is similar in character to that of Titusville; is light, reddish-brown in color, and has a specific gravity of 38° Beaume. The oil enterprise at Lowellville is, as yet, in its infancy, but it seems probable that the quantity ultimately raised there will be large.

At various places near Cleveland, and in the valley of the Cuyahoga, oil makes its appearance; generally flowing from the Portage rocks. Whether it will be found here in abundance is, at least, doubtful.

At Grafton, Lorain county, and in Liverpool, Medina county, adjoining townships, the Portage rocks contain much oil; a number of wells have been sunk which promise well, but operations are just commencing there and little oil has been raised. The Grafton oil is darker and thicker than that of Mecca, having a specific gravity of about 25° Beaume.

On Duck Creek, in Noble county, petroleum has been procured for many years from the salt wells. Within a few months past, wells have been sunk expressly for the oil with success, but how much is now raised there or what is its quality, I have not definitely learned.

The Uses of Petroleum.

Petroleum has been employed as a medicine for many centuries, and large quantities are annually collected in the i land of Barbadoes and in the United States, to be used only as a remedial agent. As an external application its efficacy in strains, rheumatism, &c., seems to be pretty well authenticated. Its medical properties when taken into the stomach are somewhat more doubtful, although it has been highly lauded as a remedy for tapeworm, and even for Asiatic cholera. Its value consists, however, for the most part in its adaptation to the wants of society in the arts.

1. *As an illuminator.*—The lighter varieties of rock oil may be burned with a proper lamp in their natural state, but all yield on distillation from 50 to 85 per cent. of burning fluid, which affords a remarkably powerful, and at the same time, soft and pleasant light. No lamp as far as I am aware, has yet been invented in which it can be well burned without a chimney; but those now so generally used for coal oil, are equally well adapted for its use. In these it burns with a brilliancy fully equal to that of the best oil distilled from coal, with less tendency to smoke, with no offensive odor, and lasting as long. Its light is superior to that of the purest sperm oil, and at present prices costs less than half as much. Affording so brilliant, so portable, and so safe a light, at so small price, it possesses every requisite for a popular illuminator; and must ultimately supersede all those now in use except gas, which, though more expensive, is less troublesome than any lamps can be, and hence will continue to be used to some extent in towns.

2. *As a lubricator.*—The rock oils which like those of Mecca and Grafton, have, in their natural state, a thick and oily consistence, and not a very offensive odor, are excellent lubricators for machinery as they come from the wells—not being liable to gum, and retaining, to a great degree, their fluidity in the coldest weather. Care should be taken in the use of the crude oil as a lubricator, to see that it is free from fine sand, which is sometimes mechanically mixed with it as it is pumped up. It is even probable that all such oils would be improved by subjecting them to a hasty distillation to rid them of any foreign matter they might contain. The Mecca oil, when thoroughly washed, has been used by a number of engineers, and so far as I have heard, to their entire satisfaction. In the process of refining, all the varieties of petroleum yield a proportion of heavy lubricating oil. The quantity of this is proportionate to the specific gravity of the crude oil, and its fluidity will depend on the quantity of burning fluid abstracted from it. Among the crude or manufactured petroleums, then, we may obtain, at a comparatively small price, lubricators of any degree of consistence, from that of lard to the finest oil, which if properly prepared, will not gum nor corrode metal, and will keep journals cool,

The consumption of petroleum for this purpose must be immense. There are some railroad companies whose annual expenses are more than $25,000 for lubricators alone. A single manufacturer in England (Young) testified in court to having manufactured and sold over 400,000 gallons of lubricating oil in one year, at about one dollar per gallon. This oil was distilled from coal. The white oil of New York, and several patent lubricators used in this country, are sold in large quantities for a dollar or more per gallon, while the mixed lard, fish and coal-oils, largely employed, and, indeed, all the lubricators in general use, command a price fully double what an equally good article made from petroleum can be furnished for.

3. *As paint oil.*—Petroleum has as yet been used for painting, in this country, but to a very limited extent, and the experiments made, though very satisfactory, as far as present appearances go, have no had the test of time applied to them. In the old world the rock oils have been quite extensively employed in painting, and have served a very good purpose in that connection. The Mecca oil, in its natural state, has been used in painting several houses, outside and within, white and brown, and apparently with entire success. The oil was boiled with "dryen," precisely as linseed oil is treated, and mixed with lead and other paints. It formed a good body, covered the wood well, dried rapidly and perfectly; and now seems smooth and hard, and has no odor. All that can be asked is that it shall hold out as it has begun. The lighter petroleums—as that of Titusville and Lowellville—are not as well suited to painting, as they come from the wells, being too thin, like spirits of turpentine; the heavier portion of them, however, when separated by distillation, may be, and, indeed, has been, successfully applied to that purpose. It is highly probable, therefore, that some portion of the rock oil raised from our wells, will find a market as a painting oil.

4. *As a fuel*—Should petroleum ever be produced in such abundance as to glut the market, and the price be reduced to fifteen cents per gallon, it will be used as a fuel on steamboats, locomotives, and elsewhere—wherever, indeed, a highly concentrated, portable and manageable fuel is required. The superiority of oil over coal for generating steam consists in: 1st. Its greater heating power, pound for pound. 2d. Its more complete oxydation in the furnace. 3. Its combustion in immediate contact with the surface of the boiler and flues.

Much discrepancy of opinion exists as to the true measure of this difference; some experimenters claiming that one pound of oil is worth as much for the generation of steam as ten of coal; others only two or three.

We know that in the Cornish engine, one of the most effective, only about 15 per cent. of the heat generated by coal is utilized. In an engine with a properly constructed oil furnace, it is claimed that no such loss is necessary, but that at least half the heat generated is used. If this is so—and I see no reason for doubting it—one pound of oil is certainly equal to four or five of coal for making steam. It is easy to see on this supposition, that for ocean steamers, for locomotives, &c., oil has great advantages over coal, as equal heating power would be included in one-fourth of its weight and space. The furnace would be less massive and heavy; the engine would feed itself with fuel as with water; there would be no ashes, &c., &c.

Mode of Raising Rock-Oil.

The process of raising the oil is very simple, and may be described in a few words. In localities where it exists in quantity, it makes its presence known by floating on streams or pools of water; by imparting its peculiar taste and smell to the water in wells; by flowing out spontaneously in springs.

When these evidences of oil are present, it is bored for. If the rock is covered with a thick coating of earth or quicksand, cast-iron pipe is driven down to it. If the earth is not more than fifteen to twenty feet thick, a pit is usually sunk. The drilling is usually done with iron or wooden rods, or both combined; the diameter of the hole being generally three or four inches. If oil is found, and the flow of water is profuse, it is enlarged to five or six inches. Great care should be taken in boring to see that the hole is *round* and *perpendicular*. Neglect of this will render it difficult to set the pump properly. If not filled with water, the condition of the well may be learned by throwing the sun's rays into it from a small mirror.

The oil is pumped up by steam, the pump being of copper or iron; the engine of a power proportioned to the depth of the well and the quantity of water raised with the oil. For most of the wells, a five-horse power engine is amply sufficient. Much care is required in setting the pump, so as to draw from the oil crevice. Barren water veins are stopped off by a seed bag—a leather jacket placed around the pump, filled with dry flaxseed, which, expanding when in place, forms a perfectly water-tight packing.

The oil and water, when raised, are thrown into large vats, when the oil, being lighter, separates from the water and floats on its surface. The surface oil and water of the first vat flow over a weir into the second, and thence perhaps into a third; the water running out of orifices near the bottom of each. From the last vat it is drawn off into iron-bound casks, and is ready for market.

The present price of crude rock oil from Titusville, Pa., in New York, is 40 cents per gallon—an advance of ten cents within a few days.

The cost of raising the oil will vary in different places, according to the depth of the well, the distance to and hardness of the rock, the price of labor, &c. At Mecca, Grafton, or Liverpool, O., the cost of a well 100 feet deep, in working order, will be as follows:

Boring 6 inch well, 100 feet	250 00
Pump and frame	150 00
Engine, 4 horse power	500 00
Three tanks, 12 by 16 by 4 feet	90 00
	$1,000 00
Engine and tank house	500 00
	$1,500 00

This estimate includes all freight, labor, &c. By many it will be thought high, but where all the work is done by paid employees, it is not too much, but probably sufficient.

At Mecca are some paying wells less than 50 feet deep, which began to make returns when but $200 had been expended on them. In Ohio the case will be an exceptional one where a successful well costs more than $1,000, before it begins to earn something.

When put in operation, a good well soon pays for itself; the cost of running it being small in proportion to the profits. The average daily expense of carrying on a 10 barrel well may be estimated at $25 to $30, viz.:

Three men	$3 00
Two cords wood	3 00
Ten barrels	20 00
Incidentals	1 00
	$27 00
Product, 400 galls. oil, sav 25 cents	100 00
Ten barrels (allowed price)	10 00
	110 00
Expenses	27 00
Daily profit	$83 00

The expenses, yield and profits of a well now in operation near Lowellville, are at present as follows:

Labor, fuel and incidentals	6 00
Loss on 20 barrels	20 00
	$26 00
Product, 800 galls. oil, worth at well 30 cents	240 00
Expenses	26 00
Daily profit	$214 00

Of this, one-eighth goes to the owner of the land.

The Mode of Refining Petroleum.

I had intended to give a brief description of the methods of purifying rock oil now pursued, but the space which my letter already occupies, forbids anything but a mere allusion to it. More than this is the less necessary, as the process of refining petroleum is similar to, but simpler than that followed in rectifying crude coal-oil.

Those who are interested to pursue this branch of the subject, will find some of the distinctive features of the treatment of petroleum in the specifications of De la Rue's patent (English) for refining the Rangoon petroleum, and in the circulars issued by Messrs. Schieffelin Bros., New York.

As yet, the attention of refiners of coal-oil and petroleum in this country has been confined to the products most readily derived from them, viz.: burning fluid, lubricating oil, and paraffine; but the European manufactures have demonstrated that the process may be profitably carried much farther, and that other and more valuable secondary products may be derived from those first mentioned. By the re-distillation of the light oil, they obtain: 1st. *Benzole*, worth from 10 to 20 cents per pound. This is extensively used as a solvent for india-rubber, gutta percha, &c., and for extracting oil from wool before dyeing it, grease from clothing, carpets, gloves, &c., &c. 2. *Nitro-Benzole*, which has the taste and smell of oil of bitter almonds, and is used for the same purposes. This is worth $1 per pound. 3d. *Aniline*, a dye used for producing the fashionable color *Mauve*—$5 to $8 per pound. 4th. *Pure violet Aniline powder*, $250 to $325 per pound.

All these may be obtained from the natural oils, perhaps in as great abundance, and as easily as from those distilled from coal.

There are two questions which will hardly fail to suggest themselves to any one who shall read what precedes: These are—1st, What will be the relation of supply and demand in regard to the rock oils in future; and 2d, Will the oil wells be individually permanent?

These questions are of not only high scientific interest, but of such practical importance that thousands of dollars would be cheerfully paid for full and truthful answers to them. Unfortunately, however, such answers cannot now be given by human wisdom; all the knowledge hitherto gained, and all the experience of the past being insufficient to enable any one to predict with certainty the issue of a case like the present, in some respects without a precedent.

The supply of rock oil is evidently destined, for present, at least, to be large, so large that the business of raising it must come down from a speculation to a common sense practical business.

The market, though prospectively almost unlimited, is for this product, not only new, but in a great measure yet uncreated. Time must elapse before the substitution is made by society of this article for that now in use. Mean-

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* In confirmation of the view that the oil of the Portage and Chemung rocks for the most part rises from the Hamilton Shales, it may be said that at Titusville, Mecca, Grafton, &c., the oil is found exuding from cracks in the surface rocks, coming up from below, and saturating the soil; and that, in boring, the most abundant flow of oil is also obtained from vertical crevices at very unequal depths, in holes closely approximated.

time, and perhaps permanently, the supply will so fully meet the demand, that only those who are favorably situated, who have wells which furnish a good article in large quantity, and pay little or no rent, will make large sums of money by them.

When we reflect that some 50,000,000 of gallons of oil, of various grades, are used annually in the United States, for purposes which may be as well and more cheaply served by rock oils, and that Europe offers a still wider market for them, quite as good as our own, we shall see that there is little prospect of the rock oils becoming wholly valueless, even if every well should continue to flow with its maximum yield, and their number should be greatly multiplied.

Whether each well will continue to yield a constant quantity of oil if steadily pumped through a series of years, is a more difficult question than that of the market or the aggregate supply. Its solution must be a matter of experiment.

The wells of India, and the banks of the Caspian, have afforded a very large and constant supply of oil for several hundred years. The petroleum springs of Hit, from which the ancient Babylonians took the imperishable cement for their Cyclopean walls, still continue to flow; and the same may be said of the oil springs of Zante, mentioned by Herodotus. They yield apparently as much to-day, as they did 2,500 years ago.

On the other hand it may be said with truth, that the petroleum springs of Gabian, Ain, and Auvergne, in France, yield now a much smaller quantity than they formerly did, and that the wells of India, Syria, Zante, &c., have never suffered the exhaustive drain of the steam pump.

One would scarcely expect that the salt sparsely disseminated through saliferous sedimentary strata—the source from which most of our salt works are supplied—would be a more permanent and reliable product of the wells bored to obtain it, than is the oil, and yet while it is true that salt wells have failed, it is also true that such failures are the exception, and permanence the rule.

The steam pump may, and probably will, drain local reservoirs, and its powers of suction may exceed the generative capacity of limited areas. We must expect that some wells will fail, but the history of those largest and most successfully pumped in the oil region so nearly constant in their yield, and effecting each other so little, gives satisfactory evidence that theirs is no ephemeral function, and has inspired a confidence in the permanence of oil wells which is to-day stronger than ever before.

A Rain Manufactory—Almost.—The Richmond *Dispatch* says: "A gentleman who resides near Boydton, Mechlenburg county, Va., has aspired to a new science—that of controlling the clouds, in order to cause it to rain at will. With the view of attaining this end, he has built a rain tower, thirty feet diameter at the base, which size it retains to the height of forty feet. To this height it contains four flues, each seven feet in diameter. The number of flues is then reduced to two, which run up twenty feet higher, the top of structure reaching an altitude of sixty feet, at a cost of about $1000. The *modus operondi* of causing rain to fall is as follows: The flues are filled with dry pine wood, which is set on fire, and kept up until the desired effect is produced on the elements. His theory is, that the great heat produced in the air above the tower will cause the clouds to concentrate over it, when plenty of rain will fall in that vicinity. The originator of this novel idea, is said to be a firm believer in the practicability and utility of his invention, notwithstanding the fact that, after repeated trials, during which he consumed hundreds of cords of wood, his tower failed to produce the desired effect on the unpropitious heavens, he having been a great sufferer from drought during the entire spring and summer."

Coal Mines.—Coal is very widely distributed over the world, although some countries are more favored than others. England, France, Spain, Portugal, Belgium, Sweden, Poland, and Prussia have their beds of coal. It is also found abundantly in Asia, Africa, and South America, but nowhere is the coal formation more extensively displayed than in the United States, and nowhere are its beds of greater thickness, more convenient for working, or of more valuable quality. There are within the limits of the United States no less than four coal-fields of enormous dimensions. One of these, the Appalachian coal field, commences on the north, in Pennsylvania and Ohio, sweeping south through Western Virginia and eastern Kentucky and Tennessee, it extends even into Alabama. Its area is estimated at about 60,000 square miles. A second occupies the greater portion of Illinois and Indiana: in extent almost equal to the Appalachian. A third covers the greater portion of Missouri, while a fourth occupies the greater portion of Michigan. Just out of the limits of the United States, in New Brunswick and Nova Scotia, there is still a fifth occupying, according to Mr. Lyell, an area of 36,000 square miles. Besides these, there are several others of less extent.—*Le Cont's Smithsonian Lecture.*

Lancaster, Pa.—Originally, (1849) Rosin Gas-Works altered in 1853 to Coal Gas-Works by John C. Cresson, Esq., and are reported as very good. Rosin gas did not pay. Iron retorts from Miller and Fellenbaum; meters of all kinds from Code, Hopper & Gratz exclusively; 2 gas-holders of 25,000 and 40,000 c. f. from Joseph Amer; 6 miles pipe from 3 to 8 inches; Westmoreland coal at $5 10 per 2,000 lbs.; charge for meters $1 50 per annum when bills are under $20; and best of all, have no debts.

ON THE OCCURRENCE OF THE HYDROCARBON C_4H_2 IN COAL GAS.

In describing the explosive red compound* which he obtained by passing a current of street gas through an ammoniacal solution of dichlorid of copper, Bœttger, (*Ann. Ch. u. Pharm.*, cix. 353), called attention to the fact that an abundant evolution of gas ensues when the compound is treated with moderately concentrated chlorhydric acid. This gas has recently been more carefully examined by Berthelot (*Comptes Rendus*, 1, 805), who finds its composition to be C_4H_2, and calls it *acetylene*, or quadricarbide of hydrogen. It is evidently the prototype of a series of hydro-carbons, the general formula of which is $C_{2n}H_{2n-2}$. According to Berthelot, acetylene is formed whenever olefiant gas, or the vapor of alcohol, ether, aldehyd, or of wood spirit, is passed through a red hot tube. It is formed also when the vapor of chloroform is brought in contact with red hot copper: and is moreover a constituent part of illuminating gas. Of the foregoing sources, ether furnishes it in the greatest abundance. In whichever of these methods the gas may have been prepared, however, it is always mixed with a large quantity of other gases, from which it must be separated in the manner indicated by Bœttger before it can be obtained in a state of purity.

Acetylene is a colorless gas, somewhat readily soluble in water, having a disagreeable and characteristic odor, and burning with a very luminous and smoky flame. Its sp. gr.=0·92; it has not been liquefied either by cold or pressure. Mixed with chlorine it detonates almost immediately even in diffused day-light, carbon being deposited. When exploded in the eudiometer, 1 volume of acetylene consumes 2·5 vols. of oxygen, and forms 2 vols. of carbonic acid. Its formula represents 4 vols. of vapor.

In general the properties of this gas are similar to those of olefiant gas (C_4H_4); and by combining with bromine, sulphuric acid, the elements of water, and with hydrogen, it forms compounds parralel to those formed in similar cases by olefiant gas.

[In a technological point of view this gas is of great interest; for not only is Berthelot's observation of the first importance in itself as a contribution to the chemistry of gas-lighting, but further investigation of the subject will no doubt lead to the elucidation of several of the vexed questions upon which gas engineers are at variance. For example, the fact that a quantity of useful gas—probably much more luminous than an equal bulk of olefiant gas—is produced when the latter is strongly heated, must be a most acceptable support to those who advocate "high temperatures" as the best system of gas making; as it must also materially modify the prevailing notion that the luminiferous properties of olefiant gas are entirely destroyed by such treatment. In a word, those who from theoretical premises have satisfied themselves that the employment of "high temperatures" in gas making is pernicious, and have therefore opposed this system, must reconsider their argument.†

Again, the knowledge that a luminiferous gas so readily soluble as acetylene occurs in coal gas, is a subject most worthy the consideration of those gas engineers who advocate the use of much water in the purification—or who, in the terse language of the opponents of their system, "would 'scrub' the life out of the gas!"

The occurrence of acetylene, and no doubt of some of its homologues, in illuminating gas, is moreover another evidence of the error, still frequently fallen into by chemical writers, of attributing all the luminiferous power of coal gas to the olefiant gas, and homologues of the series $C_2{}^nH_2{}^n$, contained in it. The incorrectness of which view has been shown by Frankland, (*Ann. Ch. u. Pharm.*, lxxiv. 57. See also lxxxii, 1.) by Lewis Thompson (Ure's *Dictionary of Arts*, &c., 4th edit., Boston, 1853, i, 438), and by others, and has been recognized, we believe, by every chemist who has latterly made a special study of the technology of gas making.

Berthelot promises soon to publish the results of his examination of the compounds which acetylene forms with chlorid of copper and with nitrate of silver‡ and of mercury, and of the analogous compounds which the last two salts form with olefiant gas. He also alludes to a method of isolating olefiant gas, the publication of which can hardly fail to interest gas makers.

It is to be hoped that in the same connection M. Berthelot will make some slight allusion to the labors of Edmund Davy, (*Annalen der Pharmacie*, xxiii, 144; from the *Records of General Science*, November, 1836, through *Journal de Pharmacie. Mars.*, 1837, p 143), who obtained from the decomposition by water of the brown mass—"carbide of potassium"—which occurs in the preparation of potassium from burnt tartar and charcoal, a gas§ of the same composition (C_4H_2) and of identical properties with that which forms the subject of this notice.

Besides this, the observations of Courbe, (*Annales de Chimie et de Physique*, 1838, (2,) lxix 184; compare Gmelin's Hand Book, x, 411, and xi, 395), should be remembered. In a liquid which was deposited by illuminating gas (from rosin) when this was subjected to pressure, Courbe detected compounds, (for example, "B"=$C_{10}H_8$, and "F"=$C_{12}H_{10}$), which accord with the general formula of the acetylene series, and which in view of their origin would seem to be entitled to a place therein, at least until their right to the position shall have been disproved. So also, perhaps, with the campholene ($C_{15}H_{18}$) of Delalande, (*Ann. Ch., et Phys.*, [3], i, 125).

While the labors of these chemists do not in the least degree detract from the intrinsic value of Berthelot's observations, they should nevertheless neither be lost sight of nor passed over in silence.] F. H. S.
—*Silliman's Journal.*

* This explosive compound has also been described by Quet, (*Comptes Readus*, 1858, xlvi, 905), who obtained it when the gas prepared by decomposing alcohol by a series of electric sparks was treated with an ammoniacal solution of dichlorid of copper. It was observed in 1839—long before the experiments of the chemists above mentioned—by Prof. Torrey, of New York, on the occasion of its occurrence in the copper service pipes at that time in use for distributing gas. (See American Gas Light Journal, Oct., 1859; *Repertoire de Chimie Appliquee*, i, 493; compare Bœttger's *Notizblatt*, 1860, xv, 117), (note).

† We would in no wise affirm either that the researches of Berthelot and Bœttger have demonstrated the excellence of the system of high temperatures, or that it would be advantageous in practice to decompose olefiant gas for the sake of the resulting acetylene, nor would we in any way imply that the constantly increasing growth of this system is due to the good quality of the gas produced—for this last is in many instances most certainly not the case; the rise and progress of the system abroad having been mainly due to a most unhealthy competition among rival gas companies. We urge only that the system of high temperatures contains one favorable element which had hitherto been overlooked by chemists. F. H. S.

‡ Compare Bœttger, *loc. cit.*, also Vogel and Reischauer, in Kopp and Will's Jahresbericht der Chemie, für 1858, p. 208.

§ This gas was called Klumene by Leopold Gmelin, in his Hand Book (Cavendish Soc. Ed., viii, 150).

Gas in England.—The owner of the gas-works at Whitby, Mr. Anthony Atkinson, M. A., is erecting new works, at a considerable outlay, on a site between the river Esk and the railway. It is expected that they will be completed soon. The railway company has contracted with the proprietor for the supply of gas for fourteen years. The price of the public lights has been reduced, and a uniform charge of 5s. per 1,000 cubic feet is made to private consumers, instead of 6s. 8d. as heretofore.—The Plymouth and Stonehouse Gas Company, from the 29th of September, have reduced their price to 3s. 4d. per 1,000 cubic feet.

Under the operation of the Metropolitan Gas Act, the directors of the South Metropolitan Gas Company have reduced the price of gas 4d. per 1,000 feet. The Phœnix Company has reduced the price 3d. per 1,000 feet. It is anticipated that a similar reduction will shortly be made by the Imperial Company.

The Surrey Consumers' Gas Company have declared their usual dividend of 8 per cent per annum for the half year last past. The net profit amounted to £6,609 odds, out of which a balance of £1,227 was carried over to the account of unappropriated profits, after payment of the 8 per cent.

The Manchester Gas Committee report that the sale of gas continues steadily to increase, the rental for the past year having amounted to £154,658 4s. 2d., being an increase of £9,403 6s. 2d. upon the rental of the previous year; leaving—after deducting for interest, £16,255 12s. 4d., and on Sinking Fund account, £13,306 5s. 6d.,—a surplus of £35,217 17s. divisible between the improvements and water-works departments. From the pressure, apparently, made by the Local Gas Consumers' Associations, who are bent on having their gas at 3s. 9d., and object to the city improvements out of gas profits, the gas committee and council have resolved on further reductions in price according to quantity consumed, the lowest to be 3s. 8d. for 1,500,000 feet and upwards per quarterly consumption, and the highest 4s., for quantities under 200,000 cubic feet. Beyond the city, the prices are to range from 4s, 2d. to 4s. 6d.

The Sheffield Gas Company directors report their dividend for the half year to be the maximum of 10 per cent. on old, and 8 per cent. on new stock, leaving a surplus of £2,269, which will raise the reserve fund to its conditional maximum, being now £6,903; so that the directors contemplate a further reduction in price. They therefore propose at once to reduce the charge for their gas to 3s. 9d. to the general consumer, and they anticipate a greatly increased consumption when they shall have reduced it to 3s, 6d.—*London Builder.*

Gas in Russia.—About eighteen months ago a company was formed for lighting St. Petersburgh with gas. The works have now been successfully started; upwards of fifty miles of main pipes are laid, the greater portion being the larger sizes, from 12 to 36 inches diameter.

On a hitherto unobserved Source of Paraffin.—At a meeting of the Chemical Society, held in London, Nov. 1st, 1860, Professor Bolley, read a paper in which he observed that paraffine has hitherto been considered a product of the action of heat on certain vegetable and mineral substances. In some experiments made in the Technical Laboratory of the Swiss Polytechnic School, on the varieties of coal used for the production of illuminating gas, Boghead shale was treated with various reagents, for the purpose of extracting some of its proximate constituents. With ether, it yielded an extract containing a substance which the author considers to be paraffine. He thinks it probable that paraffine exists, as such, in several of the materials from the distillation products, of which it has hitherto been prepared, such as peat, shale, lignite, &c., and that the process described affords a convenient method of testing such substances for its presence.

Cincinnati, O.—Coal Gas-Works built by the Company. Use iron retorts from S. S. Asheraft, Cincinnati; 3 station meters of which 1 is from Crosby of London, and 2 from Code, Hopper & Gratz; about 6,000 meters nearly all of which are from Code, Happer & Gratz; a few from Glover; the 2 long gas-holders were built by George Stacey, of Cincinnati, from drawings and specifications prepared by the Engineer, John Jeffrey, Esq.; and 1 small one by Connolly, also of Cincinnati. Use Pittsburg coal at 12 cents per bushel of 74 lbs.; 2,688 cubic inches. Bonded debt about $80,000, at 8 per cent, a better security to-day than the United States loan.

ON UTILIZING THE GASES EVOLVED IN SMELTING IRON ORE INTO PIG IRON.

The question of "Utilizing the Gases evolved in Smelting Iron Ore into Pig Iron," was the subject of a paper read at Birmingham, England, by Mr. Samuel Lloyd, Jr., of the firm of Lloyds, Fosters & Co., ironmasters, &c., at a meeting of the Institution of Mechanical Engineers, in that town, held Wednesday, October 31. The mode of effecting this object, which was treated and recommended in Mr. Lloyd's paper, was the plan patented by Mr. C, E. Darby, of the Brymbo Ironworks, near Wrexham. The following account of the invention, abridged from Mr. Lloyd's paper, is from the circular of Mr. Griffiths, of Wolverhampton, England:

An important paper was read by Mr. Samuel Lloyd. Jr.. of the Old Park Works, Wednesbury, on "the gases," at the Institution of Mechanical Engineers, Birmingham—Mr. Henry Maudslay, (London) in the chair. A large number of ironmasters, managers of ironworks, and other scientific men attended the meeting. Amongst those present may be mentioned Messrs. J. Fenton, of the Low Moor Works; W. Mathews, of Corbyn's Hall Works; N. Solly, of Willenhall Works; Charles Cochrane, of Middlesboro'; Mr. Edwin Jones, engineer at Messrs. Lloyd's, Fosters & Co.'s; Mr. J. A. Shipton. of Leamington, and other engineers and proprietors in this and other districts. The most important subject brought before the society was Mr. Samuel Lloyd's paper on the Gases and their Application, or as Mr. Lloyd describes it, Open or Close top Furnaces. The gases generated by the combustion of the fuel in blast-furnaces have been husbanded in France for a number of years, and rendered available not only for generating steam, but heating the hot-air ovens with success. More recently efforts were made in England to apply the gases evolving from English furnaces to useful purposes. Several scientific gentlemen in the Staffordshire district made the attempt from 1842 to 1857. but failed in their laudable efforts. In the meantime, Mr. C. E. Darby, of the Brymbo Ironworks took out a patent in the latter year, 1857, which not only made out a *prima facie* case on the face of the specification, satisfactory to scientific men, but in practice at the Brymbo Works amply verified the scientific principles elucidated in the specification, and from this moment the useful ignition of these gases has been available under this patent for the whole of the iron districts, it having been worked successfully at the Brymbo Works, in Wales, ever since. The principle involved in Mr. Lloyd's paper was, whether or not open or close-top furnaces were the most economical and safe mode of conducting the gases to the point of ignition. Mr. Lloyd's plan, or Mr. Darby's patent, consists of a large pipe in the form of a syphon,-dipping down the funnel head of the furnaces a few feet below the top of the load, and being connected with a chimney or shaft of sufficient height, a very large portion of the gases are attracted through this syphon, and ignited by means of conducting tubes under the steam-boilers, or hot-air ovens, wherever combustion is required. The advantages of the Brymbo patent consists in the safety which it offers against explosions in the conducting tubes or other accidents, the practice being to keep the furnace regularly filled, giving the syphon an opportunity of drawing out the accumulating gas, and by this means preventing continuous combustion at the the top of the furnace, which otherwise would take place at this particular point if the gas was allowed to evolve there in its ordinary plenitude; at the same time, if from any cause the production of the gases becomes in excess of the quantity absorbed by the ordinary action of the draught exerted by the shaft or chimney upon this syphon, then the area which encircles the syphon pipe at the top of the furnace has free access to evolve the superabundant gas through the funnel head, which affords a simple and infallible safety-valve against explosions, and pressure in the furnace, which under this state of things might supervene. It must be borne in mind, however, that to work this patent effectually, the filling must be properly attended to, and the material always kept above the orifice of the syphon pipe, which dips several feet into the top of the furnace. This plan has been tried with complete success by Messrs. Lloyds, Fosters & Co., at Wednesbury; it is now in perfect action at one of their furnaces at the Old Park Works, and the gas from this one furnace generates the steam at five steam boilers, and is quite equal to producing all the steam required for the blast engines there, which exert 100 horse-power. Mr. Lloyd stated that this patent would save 2s. per ton on the iron manufactured under the Brymbo patent, and that the gross saving for the South Staffordshire district would not be less than £72,072 per annum. He stated that there were 126 furnaces in blast in our district (which is quite correct). Taking the make at an average of 110 tons per week, gives a total make per week of 13,860 tons, which at a saving of 2s. per ton per week, shows a weekly gain of £1,386, or an annual saving of £72,072, as stated above, for this district alone. The vast importance of this subject has induced us to notice Mr. Lloyd's paper fully, feeling, as we do, that this encouraging statement will induce the South Staffordshire ironmasters forthwith to avail themselves of the important advantages which the experiment at Messrs. Lloyds, Fosters & Co., proves beyond a doubt, to be within the reach of all. It may be as well to inform the trade that Schneider, Hannay & Co.'s well known hematite works, at Barrow, were opened, and the gases worked under this same Mr. Darby's patent; they have worked successfully on this plan ever since, and as these are admitted to be the model works of all England, making the largest quantity of iron, of the best quality, consuming the least amount of fuel to the ton of iron of any known establishment, nothing we think can more cogently convince the South Staffordshire trade of the soundness of Mr. Lloyd's paper than the eminent success of the Brymbo patent at the Barrow Works of Schneider, Hannay & Co. The paper was listened to with the greatest interest. Mr. Mathews, of Corbyn's Hall, and Mr. Charles Cochrane, of Middlesboro', and Mr. N. Solly, addressed the audience on the subject. Mr. Lloyd likewise addressed the meeting, explaning his large-colored diagrams satisfactorily to the assembly.—*Phil. R. R. and Mining Register.*

AN ACT TO PROVIDE FOR THE INSPECTION AND SEALING OF GAS-METERS, AND FOR THE PROTECTION OF CONSUMERS OF ILLUMINATING GAS.

PASSED APRIL 14, 1859.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION. 1. The Governor of this State shall nominate, and by and with the consent of the Senate, shall appoint an inspector of gas meters, who shall reside in the city of New York, whose duty it shall be, when required, to there inspect, examine, prove and ascertain the accuracy of any and all gas meters used or intended to be used for measuring, or ascertaining the quantity of illuminating gas furnished by any gas light company in this State, to or for the use of any person or persons, and when found to be or made correct, to seal, stamp or mark all such meters, and each of them, with some suitable device; such device shall be recorded in the office of the Secretary of State.

§ 2. Such inspector shall hold his office for the term of five years from the time of his appointment, and until the appointment of his successor, but may be removed by the Governor for sufficient cause; and he shall receive an annual salary of fifteen hundred dollars, to be paid in the first instance out of the State Treasury on the warrant of the Comptroller.

§ 3. Such salary shall be charged to and paid into the State treasury by the several gas light companies in this State, in amounts proportionate to the amounts of the capital stock of said companies respectively, to be ascertained and assessed by the Comptroller of the State: and in case such gas light companies, or any or either of them shall refuse or neglect to pay into the State treasury the amount or portion of said salary which shall be by said Comptroller required of them respectively, for the space of thirty days after written notice given by said Comptroller to them respectively, to make such payment, then the said Comptroller may maintain an action in his name of office, in any court of this State, against any such delinquent gas light company for their said portion or amount of such salary, with interest thereon at the rate of ten per cent. per annum, from the time when said notice to make such payment was given, and the costs of the action.

§ 4. It shall not be lawful for any corporation, company or person, at any time after this act shall take effect, to furnish and put in use any gas meter which shall not have been inspected, proved and sealed by said inspector, except during such time as said office of inspector shall be vacant, or said inspector, after request made, shall refuse or neglect to prove and seal the meters furnished for that purpose, and except the meters in use when this act takes effect, and which may be removed for examination or repairs.

§ 5. That every such gas light company shall provide and keep in and upon their premises a suitable and proper apparatus, to be approved and sealed by said inspector of meters, for testing and proving the accuracy of the gas meters furnished for use by said company, and by which apparatus every meter may and shall be tested, on the written request of the consumer, to whom the same shall be furnished, and in his presence if he desire it. If any such meter, on being so tested, shall be found defective or incorrect to the prejudice or injury of the consumer, the necessary removal, inspection. correction and replacing of such meter shall be without expense to the consumer; but in all other cases he shall pay the reasonable expenses of such removal, inspection and replacing; and in case any consumer shall not be satisfied with such inspection of the meter furnished to him, and shall give to the company written notice to that effect, he may have such meter reinspected by the State inspector (if he require it) upon the same terms and conditions as above provided for the original inspection thereof.

§ 6. Upon the application, in writing, of the owner or occupant of any building or premises within one hundred feet of any main laid down by any such gas light company, and payment by him of all money due from him to the company, the company shall supply gas as may be required for lighting such building or premises, notwithstanding there may be rent or compensation in arrear, for gas supplied, or for meter, pipe or fittings furnished to a former occupant thereof, unless such owner or occupant shall have undertaken or agreed with the former occupant to pay or to exonerate him from the payment of such arrears, and shall refuse or neglect to pay the same; and if, for the space of ten days after such application, and the deposit of a reasonable sum as in this act provided (if required), the company shall refuse or neglect to supply gas, as required, the company shall forfeit and pay to such applicant the sum of ten dollars, and the further sum of five dollars for every day thereafter during which such refusal or neglect shall continue; provided that no such company shall be required to lay service pipe for the purpose of supplying gas to any applicant, where the ground in which such pipe is required to be laid shall be frozen, or shall otherwise present serious obstacles to laying the same; nor unless the applicant, if required, shall deposit in advance with the company a sum of money sufficient to pay the cost of his portion of the pipe required to be laid, and the expense of laying such portion.

§ 7. That every such gas light company may require that all, each and every person or persons to whom such company shall supply, or shall be requested to supply gas for lighting any building, room or premises, deposit with such company a reasonable sum of money, according to the number and size of lights used or required, or proposed to be used for two calendar months, by such persons or person, and the quantity of gas necessary to supply the same, as security for the payment of the gas rent, or compensation for gas consumed, or rent of meter, pipe and fixtures, to become due to the company, provided, however, that every such gas light company, shall allow and pay to every such depositor legal interest on the sum by him deposited, for and during the time his deposit shall remain with the company.

§ 8. Any officer or other agent of any such gas light company, for that purpose duly appointed and authorized by the company, may, at all reasonable times, upon exhibiting a written authority, signed by the president or secretary of the company, enter any dwelling, store, building, room or place lighted with gas supplied by such company, for the purpose of inspecting and examining the meters, pipes, fittings and works for supplying or regulating the supply of gas and of ascertaining the quantity of gas consumed or supplied, and if any person shall, at any time, directly or indirectly, prevent or hinder any such officer or agent from so entering any such premises, or from making such inspection or examination at any reasonable time, he shall, for every such offense, forfeit and pay to the company the sum of twenty-five dollars.

§ 9. If any persons or person supplied with gas by any such gas light company shall neglect or refuse to pay the rent or remuneration due for the same or for the meter, pipes or fittings, let by the company, for supplying or using such gas, or for ascertaining the quantity consumed as required by his or their contract with the company, or shall refuse or neglect, after being required so to do, to make the deposit in this act mentioned, and thereby authorized to be required, such company may prevent and stop the gas from entering the premises of such persons or person; and in all cases in which any such gas light company is or shall be authorised to cut off, prevent or stop the supply of gas from any premises, their officers, agents or workmen may enter into or upon any such premises, between the hours of eight o'clock in the forenoon and six o'clock in the afternoon, and separate, take and carry away any such meter, pipe, fittings or other property of the company, and may disconnect any meter, pipe, fittings or other works, whether the property of the company or not, from the mains or pipes of the company.

§ 10. Every person who shall wilfully or fraudulently injure or suffer to be injured any meter, pipe or fittings belonging to any such gas light company, or prevent any meter from duly registering the quantity of gas supplied through the same, or shall alter the index of any such meter, or in any way hinder or interfere with its proper action or just registration, or shall fraudulently burn the gas of said company, or waste the same, shall, for every such offense, forfeit and pay to such company the sum of twenty-five dollars, and in addition thereto shall pay to said company the amount of damage by them sustained by reason of such injury, prevention, waste, consumption or hindrance.

§ 11. Every person who shall lay or place, or cause to be laid or placed, any pipe to communicate with any main or pipe belonging to any such gas light company, or shall otherwise burn or use, or cause to be burned or used, any gas supplied or manufactured by said company, without having the same passed through the meter furnished for measuring and ascertaining the quantity of gas supplied to and consumed by such person, shall forfeit and pay to said company the sum of fifty dollars, and in addition thereto shall also pay to said company the amount of damage by them sustained in consequence, or by reason of such forbidden act.

§ 12. This act and its provisions shall not be deemed applicable to companies engaged in supplying natural gas to consumers.

COLUMBUS, GEO.—Rosin gas-works built by the late firm of Perdicaris & Hoy, Trenton, N. J., are quite satisfactory. Have iron retorts only, of course, of Brown & Co.'s make, Columbus, Geo.; Code, Hopper & Gratz's station and customer meters; Hoy's gas-holder; McIlhenny's photometer. Report dividends 5 per cent., semi-annually.

LYNCHBURG, VA.—Another of Perdicaris & Hoy's works, but for coal-gas. Merrick & Son's iron retorts in use; Code, Hopper & Gratz's wet and dry meters; Merrick & Son's gas-holders. Some 8 or 10 miles of pipe laid, ranging from 2 to 7 inches. Are abandoning cement for lead joints. Clover Hill coal is carbonised, costing 20 cents per bushel of 70 lbs. Superintendent is Mr. Jas. Cleland, who promised us further particulars.

COLUMBIA, PA.—Gas-works built by John E. Carver, and are satisfactory. Iron retorts, from Merrick & Sons. Wet-meters, from Rogers & Jones, Phenix Co., and Hammond; dry-meters, from Code, Hopper & Gratz. Gas-holder, from Merrick & Sons. Use Westmoreland coal, at $5 25 per 2000 lb. Mr. Caldwell promised us a full history of the company.

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THE
AMERICAN GAS-LIGHT JOURNAL.

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PROPRIETOR, JOHN B. MURRAY. } { EDITOR, C. ELTON BUCK.

TUESDAY, JANUARY 15, 1861.

On page 170 of the JOURNAL, it was mentioned that the Rev. W. R. BOWDITCH, of Wakefield, England, had announced a new process for the purification of gas from bi-sulphuret of carbon, and some extracts were given from the paper of that gentleman, originally published in the London *Chemical News*. Mr. BOWDITCH has recently taken out a patent for "Improvements in the purification of coal gas and of coal oils," the principal innovations of which are the use of damp clay conjointly with acids, or metallic salts, in addition to lime or hydrated peroxide of iron, and passing the gas through purifiers filled with pounded clay, slacked lime, or hydrated peroxide of iron "heated below redness." The *modus operandi* of this invention is as follows: The gas, on its way from the condenser, is made to pass through a leading purifier, containing four tiers or riddles. The two tiers nearest the inlet are charged with clay which has been employed in the ordinary purifiers and subsequently exposed to the air. The next tier is charged with an acid or solution of a metallic salt suitable for removing ammonia; and the fourth tier with clay, in the same manner as the first and second.

From this leading purifier the gas passes through a second, containing one tier of fresh clay, and the remaining tiers of lime or hydrated peroxide of iron.

From the second purifier the gas is passed through a third, where it is subjected to the action of pounded clay, slacked lime, or hydrated peroxide of iron, at an elevated temperature. It is advised that this purifier be constructed of cast iron, not more than four feet in length, with a door at each end, and it may be placed in such position as will allow no gas to pass through it without coming in contact with the heated materials used to effect the absorption of the impurities. These materials are so placed in the apparatus as to present a depth of about three feet, through which the gas traverses. Heat is applied by means of a steam jacket, which is deemed a much safer method of elevating the temperature than the use of direct heat. The material employed is cleansed of dust and particles too fine for use by means of a sieve made of wire gauze of 49 meshes to the square inch, the coarse part only being used, which should be in pieces not more than ⅛th to ⅜ths of an inch in diameter. The gas, after traversing the heated material in the third purifier, is cooled in the ordinary way, and lastly passed through cold purifiers, in the usual manner, filled with materials for abstracting sulphuretted hydrogen, ammonia, and carbonic acid.

The peculiar advantages of this process, as claimed by its inventor, are that by the use of pounded clay the sulphur compounds, other than sulphuretted hydrogen, are more easily removed from the gas, and that by the operation of the heated materials they are entirely decomposed, the sulphur combining with hydrogen to form sulphuretted hydrogen, the carbon being oxidized and converted into carbonic acid, and the ammonia, pass on to the last purifier in the series, where they are entirely removed in the ordinary manner.

It would be injudicious to express a decided opinion as to the value of this patented process, without making some practical examinations of its merits. Mr. BOWDITCH has already been before the public in connection with another patent for the employment of clay instead of lime in dry purifiers, in which he stated that not only was the purification perfect, but that the illuminating power of the gas was increased 22 per cent. Mr. LEWIS THOMPSON, who made a practical examination of this process, pronounced it a failure in every respect, and his adverse opinion led to a controversy between them, in which considerable bitterness of feeling was exhibited on both sides. In this war of words the reverend inventor had decidedly the worst of the contest, and his opponent established indisputably, that common clay had not the slightest effect, either in removing bi-sulphuret of carbon, or in increasing the illuminating power of the gas.

Another patent for purifying gas has been recently obtained in England by Mr. CROLL, in which the improvements consist of shale, spent shale or other aluminous matter and sulphuric acid which are mixed together in about equal porportions, and placed upon trays in an ordinary dry lime purifier. The mixture is to be used until test paper indicates that it has become saturated with the impurities in the gas, when it is to be replaced by fresh materials.

Whether the processes above mentioned possess any practical value, or whether they have been invented only to be placed in the same category with numerous other so-called improvements, which have been tried and found wanting, remains to be seen. Notwithstanding the many new processes and patents, we speak within bounds when we say that lime is yet the main dependence of the gas-works in effecting the purification. This substance was first brought to the notice of the public as a material for absorbing the impurities generated in the manufacture of gas by Mr. EDWARD HEARD, who obtained a patent dated June 12th, 1806 for the use of lime in dry purifiers, and the patentee also mentions in his specification, the use of several metallic oxides for the purpose of absorbing sulphuretted hydrogen, and among them includes oxide of iron, which latter substance has since been patented as a new invention by a number of individuals, some of whom are well known in connection with the gas-light interest in Great Britain. Lime has been almost universally employed since then, either alone, or conjointly with some metallic oxide or salt, despite the innumerable improved processes for which such marvellous efficiency has been claimed. In most instances the only benefits these patents have conferred, have been in the shape of fees to reward the ingenuity of the solicitor through whose instrumentality the formidable documents have been obtained. Patent after patent has been taken out, and process after process described for the better purification of gas then could be effected by means of lime alone, and yet it may be asked in all sincerity *cui bono?* Gas still contains some impurities, although these are much less in quantity and possess far less power of doing mischief than some alarmists are willing to admit. We doubt whether any other single branch of manufacture can boast of as proportionably a large number of patents, so closely resembling each other in the main points, and granted in the same time, as that of illuminating gas. Many of these patents have been essentially similar, though differing in some minute particulars, and after having been tried they have been generally thrust aside, and the employment of lime, either wet or dry, resumed. So repeatedly indeed have these new inventions been proved useless, and productive only of additional outlay and trouble, that many gas-engineers are averse to trying any new experiments, and prefer to let well enough alone by keeping the beaten track with which they are well acquainted.

Among the various substances which have been, recommended and some of them been the subject of patents, are the following; sulphate of soda, sulphate of lime, muriate of lime, various acids, chloride and sulphate of lead, ammonical water; oxides and salts of iron, manganese, zinc, copper, nickel and antimony, charcoal, alum, and number of other substances. Of the above, several are efficient in attaining the desired result, but the expense attending their use renders them objectionable, and forbids their being employed on a sufficiently large scale to be of practical value.

Theoretically, the purification of gas seems to be no difficult matter. The impurities are well known and they are readily dectected and arrested in the experimental laboratory of the chemist. But it must be remembered that the analyst in operating upon small portions of gas, is not restricted in the employment of rare chemicals and pure re-agents by economical considerations, and hence the superior advantage he enjoys, and the ready facility with which he is enabled to absorb these subtle admixtures, and to resolve them into new compounds in which their various reactions can be examined at pleasure. What is yet wanted is a plan based upon sound theoretical principles, which will prescribe the use of such re-agents as have an undoubted affinity for the base ingredients in gas, and which will be, withal, so economical in cost, as to render its adoption a matter of practical value.

NEW APPLICATION OF PEAT.—Some improvements in manufactures from peat have been patented by M. H. Hodgson, of Ballyreine and Merlin Park, and Mr. P. M. Crane, of the Irish Peat Works, Athy. The invention consists in preparing from peat, in its natural state, blocks, slabs, or pieces of any size, form or thickness, which blocks, slabs, or pieces are said, when so prepared, to be useful and economical in the construction of parts of buildings, and for various other useful purposes. They place these blocks between cloths of woven or texile fabric, or other suitable material and the peat is placed between shelves, and submitted to hydraulic or other pressure. The water is entirely forced out and the peat solidified, and drying is effected either by exposure to the atmosphere, or in a room heated artificially, or by any any other process. They are then put again between the plates of a hydraulic or other press, and extreme pressure put on them. If the product of their invention be required for use for inside work in building, such as partitions, linings, inside roofing, or for other work, as a non-conducting substance, they do not require other further preparation than shaping, provided they are not to be exposed to wet. But the slabs or pieces used for roofing (instead of slates, tiles, or other things of that nature,) they prepare to resist the wet or action of the atmosphere by steeping them in or saturating, or coating them with, some fitting material to resist wet, such, we presume, as pitch.—*Builder.*

CONCORD, N. H.—Coal Gas-Works built by Burleigh & Lord, of Somersworth, N. H., and entirely satisfactory. Use iron retorts only, from the Manchester, N. H. Iron Works. Meters from Samuel Down, N. Y. and Thomas Glover, London. 2 gas-holders of about 18,000 c. f. each, built by Somersworth, N. H. Machine Co.; 12 miles of 8 to 1 inch pipes. Use English Cannel at $12 and Pictou coals at $6 per ton. Made 3,500,000 c. f. last year.

DORCHESTER, MASS.—John Ford built the gas-works, Brisbee & Endicott furnished the iron retorts; the Boston Gas-Meter Co., the wet-meters, and Croll, Rait & Co., the dry-meters; Oliver Smith, the gas-holder. Use Pictou coal, at $4 to $5 per ton of 2,240 lbs. Mr. Carter, the agent, has lately left this company, and gone to the works which he built at Keene, N. H., as mentioned on December 1.

NOTICE.

Mr. V. HAROLD MYERS, No. 156 South Fourth Street, Philadelphia, is the sole agent of the AMERICAN GAS-LIGHT JOURNAL for the State of Pennsylvania.

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BUSINESS DEPARTMENT.

MESSRS. C. A. VANKIRK & Co., of Frankford, near Philadelphia, have taken a prominent place on our first page to offer their varied manufactures to the trade. Messrs. Vankirk & Co's. establishment is well known as being on an extensive scale and they have recently opened a warehouse and sales-room in the city of Philadelphia.

MESSRS. W. J. GRIFFITHS & Co., also of Philadelphia, enter our columns to day, for the first time, their extensive tube-works, to which particular attention is called.

GAS THERMOMETERS are advertised to-day; also a Photometer Apparatus and room, with fittings complete.

The disastrous effect of our political follies upon general business has not touched the gas and water apparatus to a serious extent, showing their freedom from the ordinary distressing influences of trade. We await patiently a settlement of this wicked quarrel before presenting to our readers an improved and enlarged JOURNAL. Until that desirable time we shall go along at half speed.

THE HONORABLE THE LIGHTHOUSE BOARD advertise a new light on the south-east coast of Africa.

THE STREET DEPARTMENT invite proposals for repairing the public lamps.

Attention is called to the announcement that Mr. V. HAROLD MYERS is an agent in Philadelphia, and Messrs. TRUBNER & Co. in London.

VISIT TO THE BROOKLYN, N. Y., WATER-WORKS.—The Commissioners of the Brooklyn Water-Works, with a number of invited guests, including in the number the Mayor of Brooklyn, members of Assembly elect for Kings County, the President of the Board of Aldermen, members of the Water Committee of the Common Council, Aldermen, and last, but not least, the Press, proceeded on Friday, Dec. 28, on a visit of inspection to the water-works belonging to the city of Brooklyn, and the sources of supply.

The company, seated in seven hacks, started from City Hall-square at 9 o'clock A. M.—one hour beyond the time appointed for starting having been sacrificed to inexorable custom. At a gentle trot the party passed through Myrtle-avenue and the Cypress Hill Plank-road to the Ridgewood Reservoir. Here they alighted and commenced a tour of inspection on foot. By the officers in charge the party were informed that the reservoir covers an area of 27 acres, and is capable of holding 173,000,000 gallons of water. At the present time, however, there are only 116,000,000 gallons in it, making a depth of 15 feet. The average quantity of water furnished the city during the week days is 4,600,000 gallons per day. On Sunday the quantity is reduced to 4,000,000 gallons.

The examination concluded here, the visitors re-entered their carriages, and proceeded to the engine-house, near East New York, where they again alighted. The pumping machinery here elicited the admiration of all present. There is but one Cornish engine at work yet. This is capable of throwing into the reservoir at Ridgewood at least 10,000,000 gallons of water per day. The material for another of the same size is on the ground, and will be put in place next summer. The engine now in use lifts at one stroke 1,054 gallons. Since it was first put in operation, one year ago last June, 1,831,500 strokes have been made. From this point, the party visited in succession Baisley's, Cornwell's Clear Stream, P. Cornwell's and Smith & Pines' ponds. A lunch was partaken of at Baisley's Pond, and the party partook of a dinner at Smith & Pines' ponds. Having inspected the whole line of works, the party returned to the city at about 8 o'clock in the evening, all well pleased with what they had seen and heard, and more than ever convinced that there is an abundant supply of pure water, and that the Brooklyn Water Works are fully equal, if not superior, to anything of the kind in the United States.

During the first year after these works went into operation, ending July 1, 1860, the receipts for water reached to $292,639 18.

PROPOSED WATER SUPPLY FOR ROCHESTER, N. Y.

Allusion has been already made in the columns of this JOURNAL to an able report by Mr. Daniel Marsh, C. E., to the Mayor and Common Council of Rochester, N. Y., on the proposed introduction of a supply of pure water into that city. To this end an advertisement has appeared in the columns of this JOURNAL, inviting proposals for the erection of the works; and by a circular from the Commissioners, it is announced that the design of the city of Rochester, in soliciting proposals for a supply of water from Hemlock Lake, is simply to effect an arrangement with a water works company, or other contractors, by which water for public purposes may be obtained on the most advantageous terms. The contractors will acquire the right to use the water of the Lake, the right of way for conveying the water-supply to the city, construct the requisite works, lay the mains, and undertake the entire work on their own responsibility. The city will contract to pay a certain sum per annum for the use of water for fire and other public purposes, to the Company who construct the works.

The city have already procured a full survey of routes, estimates of cost, and other data, which are published in a pamphlet of 68 pages, to which the attention of those interested is directed for further and more complete information on the subject of water-supply for the city of Rochester.

The report of Mr. Marsh is evidently the work of a competent, intelligent and practical engineer. First obtaining the results of the experience of other cities, he proceeds to apply that information to the full developement of the material at his command.

Among the sources of supply from which that city may be abundantly furnished with water, as we learn from the report, are the Genesee River, Lake Ontario, Irondequoit Creek, Black Creek, Little Black Creek, or the Basin in which it rises, Caledonia Spring, the Mendon Ponds, Honeoye Outlet, at West Rush, Honeoye Outlet, at Smithtown, Conesus Lake, Hemlock Lake. Of these bodies and streams of water, the most obvious and important characteristics may be stated as follows:

The Genesee River which flows through the centre of the city, with a volume of water, one-fiftieth part of which, at lowest water, would be more that sufficient to supply the city, would furnish the most simple and cheap mode of meeting this great want of our population, were it not objectionable on account of the quality of the water. Besides its proverbial hardness, the water of this river is frequently rendered turbid and unfit for use, by the effects of floods in the river. At such times the fine mould from the alluvial formation of the valley above, is borne along, mechanically suspended in such quantities that it does not wholly subside until the waters of the river are intimately mingled with those of Lake Ontario.

By means of subsiding or filtering reservoirs, this impurity might probably be removed. The quality termed hardness, is principally owing to the presence of lime too intimately combined to be separated by filtration, and is derived principally from the tributaries which flow into the river upon the west side, below Mount Morris, and although not invariable in its proportion to the whole quantity of water in the river, it is a serious objection to the use of this, as a source of supply for Rochester, unless reservoirs were to be constructed of such capacity that resort to the river itself could be dispensed with, except at times of high water. When the volume of the water is increased many fold by recent rains, the quantity of lime-bearing water, in the whole quantity, remains almost invariable, and thereby the degree of hardness is greatly diminished. There can be little doubt that the water of this river may be rendered as good as that which is now supplied to many cities in this country, and much better than that which is furnished to several cities of Europe. The unoccupied water power at the Rapids affords a convenient and economical means of elevating the water to the proposed distributing reservoir.

Lake Ontario presents the purest and most copious supply of water in the vicinity of Rochester. The distance of this Lake from any suitable site for a distributing reservoir, and the elevation to which the water must be raised by either steam or water power, although very serious objections to this plan of supplying the city would not be deemed insurmountable, if the water of the lake could at all times be obtained in the purity which it presents at a distance from the shore, and out of the range of admixture with the waters of the Genesee River. A supply from this source would be subject, like that distributed to Cleveland and Chicago, and perhaps in somewhat less degree, to Buffalo and Detroit, to become turbid and unpleasant at the time of every storm on the lake, and if taken from the lake within the distance of from 1 to 3 miles from the mouth of the Genessee River, it would at times be deteriorated in quality, by the presence of the river water, which may always be traced to a considerable distance in the direction of a prevalent wind.

By either steam power to be located at the Lake Shore, or water power at the Lower Falls, on the river, a sufficient quantity of water may, with certainty and success, be elevated to the distributing reservoir, and thence conveyed through the city by gravity.

From Black Creek, in the town of Chili, at a point about 5 miles south-west of the distributing reservoir—from the Irondequoit Creek in Penfield, at a point where the stream in its winding course approaches within 4½ miles of the reservoir, and from the Honeoye outlet at West Rush, about 14 miles from the reservoir, the requisite quantity of water could, at the lowest stages in these streams, be obtained to supply the city. In each case pumping machinery would be required. For a supply from Black Creek, the most economical plan would be to conduct the water from the Creek to the Rapids in either a pipe or a conduit of brick, and from that point to elevate the supply by water-power to the reservoir. From the Irondequoit Creek, the supply should be elevated by steam power, to be located near the creek, through pipe directly to the reservoir. From the outlet at Rush, an open channel would convey the water to the Rapids, and thence by water-power it could be elevated to the reservoir.

Near the village of Caledonia, about 19 miles from Rochester, there is found a copious and beautiful spring, discharging from 2 to 4,000,000 gallons of transparent water each day. This water might be conveyed in pipe to this city, but, on account of the distance, not at an elevation sufficient for its distribution by gravity.

Both the quality of the water from all the sources just named, and the cost of the works which would be required to convey the water to a suitable distributing reservoir, together with the continual expense of pumping, are considerations which render these sources of supply for Rochester objectionable, compared with the outlet of Hemlock Lake, at Smithtown.

In the west part of the town of Mendon are several ponds of considerable size, and of sufficient elevation for their waters to be conducted in pipe, by the force of gravity to the distributing reservoir—but the quantity of water flowing from them is quite insufficient to supply the city, being only about 500,000 gallons per day.

These ponds, and the valley in which they are situated, are important only as they are located on a feasible route for pipe, or other conduit from Hemlock Lake, or its outlet to the city, and may become the site of a large storing reservoir for the waters of this lake.

It may be interesting to note the extent and capacity of the lakes, as exhibited in the following table:

Table showing the Extent and Capacity of the Lakes, their Depth, Drainage and other Characteristics.

	Honeoye.	Canadice.	Hemlock.	Conesus.
Length miles.....	4 1–5	3 1–10	6 7–10	7 4–5
Width "	⅘	⅓	6–10	⅘
Depth—feet	10 to 25	50–80	45–80	35–70
Area—acres	1727	648	1828	3,330
Drainage—acres....	36,100	8,883	27,554	39,980
Swamp at head of Lake, acres.....	715	45	100	0
Dist. from Rochest'r	28	28	26	29
Minimum discharge in cubic feet per minute	300	200	300	150
Same in gal's p. day	3,240,000	2,160,000	3,240,000	1,620,000
No. of gal's in 1 foot depth at surface..	560,290,500	178,378,200	505,731,600	1,078,926,780
Eq. to gal's p. day	1,535,042	488,707	1 385,566	2,955,963
Add min'm flow..	3,240,000	2,160,000	3,240,000	1,620,000
Total daily discharge of each Lake.....	4,775,042	2,648,707	4,625,566	4 575,963

In the above table, the quantity of water which may be furnished from Hemlock Lake, by making a draught upon the same, as upon a reservoir one foot deep, is shown to be for the whole year, as stated in gallons per day 1,385,566

Do. of Canadice Lake, 1½ feet deep, 733,000

2,118,626

This for four months only, would be 6,355,878

Should Hemlock Lake be drawn down 2 feet, and Canadice 3 feet, the quantity would be 4,237,252 gallons per day, for the year, and 12,711,756 gallons for 4 months.

For the remaining part of the year, the natural discharge of these two lakes would be ample both for the wants of Rochester, and for the mills situated upon the outlet.

As the purity of the water supply is a subject of great importance, as affecting the health of a community, it may be well to note the comparative content of solid matter per gallon which the various streams and ponds in the vicinity of Rochester hold in solution.

	Source of Locality.	Grains of solid matter per gallon.
1.	Lake Ontario, mouth of Genesee, w. of piers,.....	4 16
2.	Do. in front of piers, ¼ mile out in the Lake	10·00
3.	Do. north-east of piers and beyond the stream discharged from Genesee River.....	6·40
4.	Genesee River at Rapids	11·21
5.	Do. at high water, April, 1860.....	6·40
6.	Do. at low water, June, 1860.....	9·60
7.	Do. at high water, August, 1860.....	7·46
8.	Do. at a higher state of water subsequent to the above, August, 1860.....	5·60
9.	Do. high water subsiding.....	4·53
10.	Irondequoit Creek, Penfield.....	24·68
11.	Black Creek, Chili.....	72·80
12.	Little Black Creek, Chili.....	9 40
13.	Tonawonda Creek, Batavia.....	12·57
14.	Caledonia Spring.....	44·80
15.	Mendon Ponds.....	8·00
16.	Honeoye Outlet, West Rush.....	6·13
17.	Do. Smithtown, (1853,) taken at a moderate rise of water.....	4·31
18.	Do. at low water.....	2·40
19.	Honeoye Lake.....	4 00
20.	Hemlock Lake.....	1·33
21.	Erie Canal at Rochester, July, 1860.....	8·00
22.	Acid Spring, ¼ mile west of Rochester.....	19 20
23.	Well, North Fitzhugh Street.....	26 00
24.	Do. South do.	16·74
25.	Do. North Washington Street.....	34·11
26.	Do. Third Ward Tavern, Cornhill.....	41·00
27.	Do. East Avenue, near Gibbs Street.....	32·16
28.	Do. South Avenue.....	20·64
29	Average of Wells in Rochester	28·33
30.	Cistern Water, soon after rain.....	6·40
31.	Rain Water taken in an open vessel.....	1·00
32.	Filtered Rain Water.....	14·10
33.	Do. do. second sample.....	6·40
34.	Rain Water from a cistern.....	2·16
35.	Do. from same cistern, filtered.....	4·33
36.	Filtered Rain Water.....	1·92
37.	Do. do.	8·97
38.	Black Creek, second sample.....	74.00

From this table it will be seen that while the waters from many of the above named sources contain much foreign matter in solution, rendering their utility questionable in many instances, the waters of Honeoye and Hemlock Lakes evince a remarkable purity, which eminently qualifies them for supplying the wants of a growing community.

In either of the plans proposing the elevation of water to the distributing reservoir, an extensive storing and subsiding reservoir is an essential feature. If taken at low water, both the waters of the Genesee River and of Little Black Creek are objectionable, and subsiding and filtering reservoirs would be requisite, and the reservoir should be of sufficient capacity to supply the city for 100 days.

Although the history of such reservoirs has been for the last few years rather unfavorable to such a project, the difficulties encountered at Boston, New York, and other cities, owing to the putrefactive action of decaying vegetable matter in the bottom of the reservoirs can be satisfactorily explained and remedied. From the reports of several eminent chemists, these effects are not considered lasting, nor as imparting any unwholesome quality to the water, and the unpleasant effects would be avoided by forming reservoirs of greater depth, with their inner surfaces free from perishable matter.

As regards pipes for distributing the water, estimates are furnished only for those made of cast iron, sheet iron and cement, and wood and cement. Cast iron water-pipes were first laid in London in 1810, and although they have been generally adopted since then, they are objectionable on several accounts. Pipes may be made of this material of any desired strength, and may be made more readily to assume any required form and dimensions; but since this material has no uniform modulus of strength, it becomes necessary to give to the castings an extra thickness, to compensate for the deficiency. This form of pipe should never be laid without being first subjected to a pressure of 300 lbs to the square inch, which will generally disclose its defects. Although it may be made of a thickness sufficient to resist any uniform pressure, when subjected to irregular pressure or rapid concussion it often bursts. Another great objection to its use is the "tendency to the absorbtion of the iron and the gradual formation of concretions or tubercles in the interior of the pipes, by which their capacity is diminished and the flow of water impeded."

Another form of pipe is made from sheet iron, of guage of No. 16 to 23, riveted together and lined with hydraulic cement, the elbows and connections being riveted or soldered together, and the service cocks being soldered to the street pipe. When well constructed, this has been found to be substantial, and has been made to stand a pressure of 240 feet head of water.

The pipe formed of banded wood and cement forms a cleanly conductor of water, and is stiff and firm from any stress from without. It is constructed of cylinders of wood, bored by machinery in sections of 8 feet in length, coated externally with hydraulic cement, and wrapped from one end spirally to the other with bands of iron coated with heated coal tar. With a band of iron ¼ inch thick, and the spiral windings 4 inches apart, they have withstood a pressure of 400 lbs. to the square inch.

The daily amount which it is estimated will be required for the present population of Rochester (50,000) is 2,000,000 gallons, which is equal to 40 gallons for each person.

In the able report of Mr. Marsh, estimates of the cost of five different plans of furnishing the proposed supply are furnished, and we regret that their length precludes the possibility of publishing them here. Those who feel an interest in the matter would do well to obtain a copy of this report, which will amply repay a careful perusal.

The construction of a permanent system of water-works, and the introduction of an abundant supply of pure water into Rochester, will benefit all its public and and private interests, much beyond the amount of income, which may be derived from water rates. So important an element of prosperity added to its present advantages of position, soil and climate, will be felt through almost all the relations of industry, enterprise and capital, increasing to some extent the value of all kinds of property. To what extent the opinions of the most judicious would vary, and there are no sure data from which a reliable estimate of the amount can be made. The amount of the assessed valuation of real and personal estate in Rochester is $11,250.157, and perhaps the real value is not less than $20,000,000. The lowest rate at which, in the judgment of the least sanguine of its citizens, this amount would be increased, would afford a very considerable proportion, if not the whole amount, required to construct water-works for the city.

From sources which are deemed entirely reliable the amount of the premiums paid in Rochester the last year for insurance, is found to be not less than $1.0,000, and it is believed that not more than one half the property exposed to loss by fires, and which would be benefitted by a full supply of water, is now insured.

The difference in the rates of insurance in Boston and Charlestown, cities adjacent to each other, the one having an abundant supply of water, and the other no foreign supply, as ascertained from authentic sources, is nearly ¼ of 1 per cent. The Croton Water Board, soon after the introduction of the Croton water into the city of New York, stated the reduction in the rates of insurance in that city to be higher than this. It is believed that the reduction of the rates in Rochester would be at least 15 cents on $100. Citizens will thus at least save $19,500 in the amount of premiums paid annually for insurance, and also be benefitted by an equal amount in the protection afforded by a full supply of water, and an adequate number of fire hydrants, to property not now insured, making an aggregate of $39,000.

The above strong argument in favor of the introduction of water, applies no less to other towns than to the city of Rochester: and many other reasons might be adduced to prove the innumerable advantages affecting the health and happiness of a community, resulting from a plentiful supply of pure water. There are a large number of cities in our country which are very backward in this respect, and which would be pursuing a wise course in imitating the example of Rochester, in making the effort to obtain this valuable treasure. We hope we will soon have the pleasure of congratulating this rising city of our State, on the accomplishment of her wishes, and trust that the anticipations of her inhabitants regarding the benefits to be derived from the proposed supply will be more than realized.

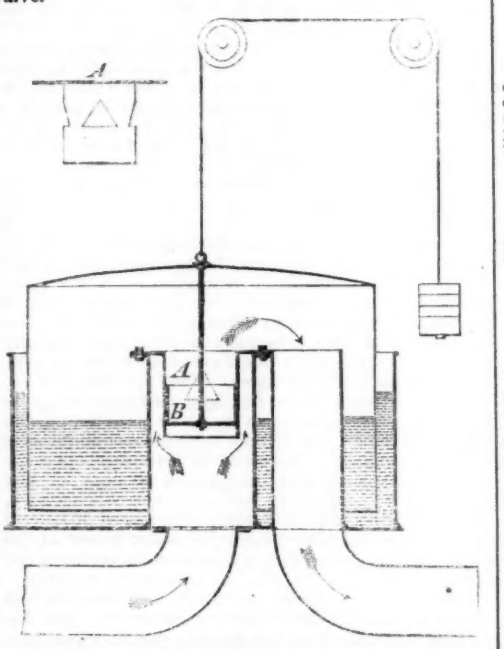
CORRESPONDENCE.

NEW COMPENSATOR VALVE.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

Engineers who have used, in connection with an exhauster, a compensator with a cone-valve attached, have, I presume, found it impossible, where there is a heavy back pressure, to keep the valve closed and at the same time maintain it in equilibrium with the balance-weights without causing a violent jar, occasioned by the valve coming in contact with its seat. To remove this evil, it is customary to arrange the balance-weights so that the valve will remain partially open, thus allowing a continuous flow of gas from the outlet to the inlet pipes of the exhauster; in which case that machine must be driven at a much greater speed than would be required if the compensator valve were entirely closed. An exhauster should pass the gas that may be delivered from the retorts only, and should not draw it *back* through the compensator, excepting when the speed of the exhauster is suddenly increased, when the valve should fall and allow the gas to pass to the inlet pipe, thus preventing the formation of a vacuum in the mains between the retorts and the exhauster.

The following diagram will explain the operation of a valve which I have lately devised and put in use. It fully answers the purpose, being very sensitive and entirely free from the objections made against the cone valve.



A A is a cylinder, and B a piston; the former has cut through its side four triangular openings for the passage of the gas. As the piston falls, the flow of gas from the inlet to the outlet of the compensator is increased, and as it rises it is diminished until it is entirely cut off. The cylinder should be bored and the piston turned, so as to work freely and yet be nearly gas tight. J. A. H.

NEW YORK, January, 1861.

BATTIN, DUNGAN & CO.'S GAS-WORKS.

PHILADELPHIA, Dec. 27, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

I observe a statement, in your number for December 15, that Mr. S. S. Battin has been "identified with the construction of some thirty or forty gas-works, among them, Albany, N. Y., Charleston, S. C., Newark, N. J., Reading, Pa., Rochester, N. Y., and Syracuse, N. Y."

Having been a partner in the firms who constructed all these works, I have a right to say that Mr. S. S. Battin was not identified with either of them. I should add that Mr. B. is no doubt a very respectable gentleman, but the article in question claims for him entirely too much.

Yours, truly,

C. B. DUNGAN.

We find that the builders of the works above referred to, were Battin, Dungan & Co., composed of our esteemed correspondent and the father of S. S. Battin; our information came from the son, who, it appears, stole his father's thunder.

LOUISVILLE, KY.—All the reports from this company are prompt, full and accurate, and we take this occasion to return to Mr. Robert G. Courtenay, the able and obliging president, our thanks for his always courteous and gratifying responses to our enquiries. It is hardly possible to appreciate the aid and value of such attention in labors of statistics and compilation. These gas-works have been enlarged and improved within a few years. We have concluded, on re perusing the report, to print our questions and Mr Courtenay's answers in full. They are a model for other companies to follow, and we will gratefully acknowledge similar attentions, in reply to our last circular of enquiry.

OFFICE OF THE AMERICAN GAS-LIGHT JOURNAL,
254 Canal street, New-York City.

REPORT TO BE DATED AND SIGNED BY SECRETARY.

Year of organization? 15th February, 1838.
Chartered name of Company? (Originally, Gas & Water Co.) Now Louisville Gas Company.
In what city or town? Louisville, State of Kentucky.
Chartered capital? $600,000; capital in use, $481,400.
Shares? $50 each, at par.
Last semi-annual dividend? 6 per cent.
Usual months of declaring dividends? January and July.
Name of President? Robert G. Courtenay.
Do. of Secretary? None; John S. Cain, Cashier and Book-keeper.
Name of Engineer? None; President acts in all construction.
Name of Superintendent? Thomas Rankin; John Walton, Inspector.
Are the works for Coal, or Rosin, or Rosin Oil? Coal.
Name of builders or patentee of the Works? See pamphlet referred to in letter.
How do you like the Works—are they satisfactory? Works of the best construction.
If you have changed Rosin Works for Coal Works, or otherwise, please state in what year such change was made—and why? Originally for Coal; no change, except additional works on an improved plan, all made in Louisville, Ky.
Number of Clay Retorts—whose make? None; ordered 33 from Belgium.
Number of Iron Retorts? 66 set.
Whose make? Roach & Long, Louisville, Ky.
Number of Station-Meters? 3.
Whose make? 2 Crosley, England; 1 Code, Hopper & Gratz.
Number of Wet Private Meters? 2,433.
Whose make? Samuel Crosley, England; Colton, Code & Co., and Code, Hopper & Gratz, Philadelphia.
Number of Dry Private Meters? 686.
Whose make? Thomas Glover, England; Code, Hopper & Gratz, Philadelphia; Samuel Down, and G. Pritchard, New York.
Number and sizes of Gas-holders? See pamphlet as above.
Whose make? Made at Gas works, by Louisville mechanics.
Do you use a Photometer? Yes—Bunsen's Screen, Ritchie's.
Number of Exhausters? None. Intend to connect Exhausters.
Total length of Mains, in miles or feet? 36 miles, 2,933 feet.
Sizes ranging from—

	2 in.	3 in.	4 in.	6 in.	10 in.	12 in.
Feet....	49,086	35,525	93,395	2,950	8,521	3,536

We are now laying more pipe.
Are your Mains joined with Lead, Cement, or Lime, and which do you find, or think, the best? Please give your reasons for your opinions. Lead joints. We know of no other material that can be relied on for a tight joint in street mains. Lead will permit the pipes to contract and expand slightly, and still keep the joint gas tight.
Number of Private Consumers? 2,866.
Number of Public Lamps? 951.
What kind of Coal do you use? Pittsburg and Virginia Cannel.
In what proportion mixed? In winter, ⅓ Cannel.
Cost of the various Coals delivered at your Works? Please state carefully the price, and for what weight or measure. We purchase 2,688 cubic inches for a bushel of 76 pounds. In the year—

1855	Coal cost	$3.12	for 2,000 lbs.
1856	" "	4.02	"
1857	" "	3.73	"
1858	" "	2.98	"
1859	" "	2.80	"

Number of cubic feet gas made in 1858? 47,511,100 cubic feet.
What rent do you charge for Meters? See section 4 of terms.
Population of your Gas District? Don't know.
How do you cleanse your Gas—by Lime or Water? Both are used.
Bonded indebtedness? None. Owe no debts. We hold the Bonds of the City of Louisville for $86,000, received for her subscription for stock in the company.
☞ Please send us a copy of your Charter; also, one of each of your Reports. We have no regular Reports. Also, your form of keeping accounts.
☞ Please state how many boxes there are in your Post Office. (See below.) We wish to place a JOURNAL in each.
☞ Please give us a succinct history of your Company on the back of this page—if anything else of interest occurs to you.
Post-Office, Louisville—

1,440 boxes, numbered from	1	to....	1,440
216 small drawers, "	1	to....	216
28 large " "	1	to....	28 for Edit'rs.

We are now constructing the fourth section of our works, 12 ovens for 36 retorts, with the purifying apparatus. We expect to set these ovens with clay retorts. We have ordered 33 through Elliman Brothers, New York, from A. Keller, Ghent, Belgium; and 3 clay retorts from Hoadley, Cleveland, Ohio.
The pamphlet, "Louisville, &c.," page 58, sent you with our letter of 11th July, Contains a concise sketch of our Gas-Works.
Our reports are but seldom published. I send you our charter, copy of rules (see Sec. 4, for meter rents) and three other pamphlets.

ROBT. G. COURTENAY, Pres.

CHICAGO, ILL.—Works built by George F. Lee & Co., Philadelphia, and are highly approved of. They use between 300 and 400 iron retorts, made by J. W. & J. F. Starr, of Camden, N. J. and R. D. Wood & Co., Philadelphia; meters from Code, Hopper & Gratz, chiefly, and from Thomas Glover, London; gas-holders built by Messrs. Starr, Mason & McArthur and P. Deily. Use no photometer (they ought to) nor exhauster. Have introduced a few clay retorts made by Thomas Hoadley, Cleveland, O. Mains are about 45 miles in length ranging from 3 to 16 inches diameter. Use Mount Carbon coal, costing $3 85 per 2,000 lbs. Made over 90,000,000 c. f. gas last year. The opposition company if not died out are quiescent, as the regular has lately obtained the contract for the city lamps for a number of years to come.

DUBUQUE, IOWA.—Called the Julien Gas-Light Co Works built by Samuel Ross; iron retorts from Pennock & Hart, Pittsburg; use wet and dry meters from Code, Hopper & Gratz, Philadelphia; Geo. Stacey's gas-holder; seven miles of mains; Illinois coal at $4½ per 2,000 lbs.

ANSWERS TO CORRESPONDENTS.

C, K. of Pa.—*Fire damp is identical with light-carburetted hydrogen, or marsh gas, and is sometimes denominated pit gas. The explosions which occur in coal mines and which are so often attended with fatal consequences, are due to the mixture of this gas with atmospheric air. and it was in order to afford a protection to the miner that Sir Humphrey Davy contrived his celebrated safety lamp. Of course the screen of wire gauze which encloses the flame, diminishes to a great extent its illuminating power, which according to the photometrical experiments of Mr. T. J. Taylor and others, is equal to one eighth of a standard wax candle of 6 to the pound.*

D. B. of Ind.—*We think you will not regret making the experiment of substituting clay retorts, for a portion, at least, of the old iron ones you are about replacing by new retorts. For further particulars, we refer you to our advertising columns, where you will see the cards of a number of manufacturers of this apparatus, American as well as foreign. If you do make the trial let us hear the result, as we like to be advised of what progress is being made in all branches of gas-lighting. Our predilections are decidedly in favor of clay retorts, and we do not think you will differ with us in this opinion, after having fairly tested them.*

J. D. I. of Tenn.—*The interesting papers, by M. E. Kopp, on the preparation of artificial coloring matters from coal tar, will be continued in our next. They have been read with interest by chemists throughout the country, and convey much valuable information.*

A. J. McD. of Iowa.—*The pressure, in inches, at which gas is delivered to consumers, in several cities, is as follows:—*

Manhattan Gas Light Co, New York City.—*Average pressure about 12 10ths of an inch. Maximum pressure at the greatest elevation, 26-10ths, and the maximum at the lowest point 9 10ths of an inch.*

New York Gas-Light Co., New York City.—*Average pressure, 12-10ths of an inch. Highest points, 2 inches.*

Boston, Mass., Gas-Light Co.—*Average pressure, 2 inches Maximum pressure at the greatest hour of consumption, about 2¼ inches.*

New Haven, Ct., Gas Light Co.—*Pressure at works, 2 4-10ths inches; at lowest points, 8-10ths inches. Highest points, when the stores are closed, 2 7-10ths inches. Average pressure, 1 to 1 5-10ths inches.*

Albany Gas-Light Co, Albany, N. Y.—*Pressure at lowest point (15 feet below the works) 2 8-10ths inches. Highest point (196 feet above the works) 4 6-10ths inches.*

GAS IN ENGLAND.—In the outskirts and suburbs of London the buildings look more cheerful and are generally disconnected and surrounded with liberal and well arranged garden plots. The cottages are from two to three stories in heighth, and usually nearly square—say 30 to 40 feet—and having four chimneys. They stand from 10 to 25 feet back from the street line, and are all fitted with the modern improvements—gas being always introduced, and in much greater use than in America.

There is not a street about London destitute of gas lamps, and for ten to twenty miles out, you may enjoy the company of the artificial light. In fact there is hardly a city or village in England without gas and the pipes appear to run through many of the country roads and fields. One often wonders to see beautiful gas light wasting its brilliancy beside some untravelled farm road, or peeping over a six foot hedge. It seems sad to think that so much light should be spent for naught when Gotham sighs in darkness almost universal, when perchance the almanacs and the moon agree to disagree. But the English people lose nothing by their abundant light. Good lamps tend as much towards life and property as the most vigilant policeman.

PATENTS.

Inventors are informed that Patents are procured at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, through F. C. TREADWELL, Jr., Esq., an experienced Patent Agent and Expert, in the United States, and in all other countries where Patent Laws are in force.

UNITED STATES.

39,669.—Isaac Cressman, of Philadelphia, Pa., for an Improvement in Gas Stoves:

I claim the combination with gas stoves, ovens or heaters having double walls or plates, at two opposite sides and top and bottom thereof, so as to constitute a continuous jacket or hot air chamber, in which the products of the combustion of gas may be allowed to circulate at pleasure of a burner or burners surmounted with inverted truncated cone-shaped cups having air openings in the bottom and a flange on the top, so that the said cups may be supported in corresponding holes in the bottom plate of the oven, in such a manner as that it or they shall be flushed or nearly so with said bottom plate, and that an unobstructed circulating medium for the heated gases may be obtained.

30,703.—M. L. Collender (assignor to himself, the Warren Chemical and Manufacturing Company and Elbert Perce), of New York City, for an Improvement in Hydro-carbon Burners:

I claim the employment of the auxiliary jets and cap or heater, D, in combination with the air mingling chamber, C, substantially as and for the purposes shown and described.

30,710.—Henry Austin, of East Liberty, Ohio, for an Improvement in Water Carts:

I claim as a new agricultural implement a cask with journals, draught frame and wheels, the whole being constructed and arranged in the manner and for the purposes specified.

30,724.—C. F. Cory, of Lebanon, Ill., for an Improvement in Furnaces:

I claim the special construction and arrangement of a furnace, having one or more open fronts, e e f f, Fig. 1, and the cold air chamber, e 2 e 2, Fig. 2, with the perforated or ventilating fire back, g g, hot air chamber, I, and valve, K L, the diaphragm drop guard or suspension back, P P, the cut-off, n, and check wall, q, as fully set forth and described.

30,738.—Joseph Leeds, of Philadelphia, Pa., for an Improvent in Hot Air Furnaces:

I claim providing a surface of water over the lower part or floor of the warm air chamber, and below the heater thereof, substantially in the manner described and for the purposes specified.

And in combination therewith, I also claim discharging spray or minute jets of water through the rising air in the warm air chamber, substantially as described and for the purpose specified.

30,752.—Oscar Paddock, of Watertown, N. Y., for an Improvement in Hot Air Furnaces:

I claim the combination of weighted arm, K, connecting rods, G and J, and valves, C C, arranged in the relation to each other and to the door, B, herein set forth, and operating substantially in the manner and for the purposes described.

30,753.—William Pauli, of Alexandria, Va., for an Improvement in Heaters for Railroad Cars:

I claim the arrangement of a heater provided with an upper chamber, c, above the fire box, A, side chamber, B, smoke pipe, E, tubes, F, when employed with tubes. D D, provided with upper and lower registers and rods, b b, operating substantially in the manner and for the purpose of heating railroad cars.

30,776.—D. E Teal, of Norwich, N. Y., for an Improvement in Apparatuses for Drawing Water:

I claim the employment of the brake and pawl lifter, F G, in combination with the crank, D, ratchet, C, and drum, B, as shown and described, for the purposes set forth.

[This invention relates to a combined stop and brake mechanism, applied to the windlass in such a manner that both may be actuated by manipulating the crank, or without taking the hand therefrom. The object of the invention is to facilitate and expedite the operation of the ordinary well windlass, and enable the operator to have perfect control over the ascent and descent of the bucket.]

30,825.—J. B. Johnson, of Boston, Mass., assignor to John Sparrow, of Portland, Maine, for an Improvement in Pumps:

I claim having the outside cylinder divided into three compartments, G G F, separated by the abutments, D D, which entirely surrounds the moving barrel, A, as shown and described, so that the said cylinder, A, will work in equilibrio.

I also claim the extension of the moving barrel, A, beyond its outer cylinder, so that said cylinder may be operated by the application of proper force to said exterior end—all as shown and described.

I also claim the arrangement of the chamber, N, directly over the suction chamber, F, so as to conduct the water in a direct line to the vacuum chamber—all as shown and described.

I also claim the comoination of the barrel, A, with the valve rod, R, as showe and described, so that the same eccentric that drives the slide valve will also operate the barrel. A—all as set forth.

I also claim the employment, within the moving barrel, of the stationary piston head, J, when constructed and operating as and for the purpose shown and described.

30,829.—A. D. Merritt and Cornelius Kemplen, of Woodstock, Ill., for an Improvement in Supplying Locomotive Engines with Water:

We claim the employment of the inverted truck, D, placed beneath the truck and made adjustable, as described, by means of which truck the engine drivers are raised from the rails, as and for the purpose specified, substantially as described.

30,844.—Enoch Thomas, of Beverly, Va., and W. K. Hall, of Phillippa, Va., for an Improvement in Hydraulic Engines:

We claim the arrangement of a swinging gate, A B, and concentric seat, D, in combination with a swinging valve, F F, and curved abutment faces, E E H H, all being arranged and operated substantially in the manner and for the purpose set forth.

30,848.—Luther Wentworth, of Burlington, Iowa, for an Improved Apparatus for Elevating Water:

I claim supporting the vertical shaft, E, of the wind wheel of said apparatus upon the dish-shaped turn table, D, when the said table is made to close an opening in the base plate, A, which is surrounded by the annular trough, G, and when the endless series of connected buckets, S S, are made to pass up and down through apertures in the said dish-shaped turn table, all substantially as set forth.

I also claim combining the shaft, H, of the described wind wheel with the hinged vanes, V V, when the springs, D D, and the weight, Q, are combined with the said hinged vanes, and when the said wind wheel is made to operate the series of connected buckets, as, substantially in the manner set forth.

30,856.—J. J. Marcy (assignor to Edward Miller), of Meriden, Conn., for an Improved device for Securing Lamp Chimnies:

I claim the combination of the two simultaneously acting hooked levers, C D, with each other and with the lamp top, in the manner shown and described.

[The object of this invention is to obtain a simple and efficient device for securing the chimney on the lamp top, so that the former cannot be casually detached from the latter, and at the same time be readily secured on the lamp top and removed therefrom. The invention consists in having two or more hooks formed at the ends of levers secured to the under side of the upper part of the lamp top, and arranged in such relation to a spring as to effect the desired object.]

30,879.—A. A. Hotchkiss, of Monroe City, Mo., for an Improvement in Water Drawers:

I claim the arrangement of the weight on the "bite" of the rope in connection with the bucket and cleet, d, in the manner described, so as to keep the weight out of the water entirely and the bucket from descending too low, so that neither of them shall rill the water when used in connection with the drawing apparatus described.

30,881.—J. F. Keller, of Greencastle, Pa., for an Improvement in Water Elevators and Conveyors:

I claim the water carriage, D, in combination with the pendent portion of the rail, A, said carriage being provided with wheels which clasp the sides of the rail for the purpose of guiding the carriage when descending or ascending the well, substantially as set forth.

I claim the use of the tilting rails, B, in combination therewith, for the purposes set forth.

30,893.—J. D. Squires, of Cold Spring, N. Y., for an Improvement in Apparatuses for Raising Water:

I claim the ring, I, either plain or provided with depressions c c, attached to the bucket by ears, b b, or their equivalent, and leaving a space between the bucket and the ring, when the same is used in combination with the tilting rod, H, substantially as set forth.

I also claim the wedge piece, N, provided with the wedge-shaped arms, i and k, and intermediate space, l, in combination with the hinged brake, L, acting on the windlass, substantially as described.

30,894.—E. S. Taylor and H. S. Larned, of Cleveland, Ohio, for an Improvement in Water Elevators:

We claim the rib, L', spirally inclined planes, J J, and niche, I for facing the spout of the bucket, O, to the spout, B, of the curb, as specified, and in combination therewith, we claim the special arrangement of the lip, H, and box, K, for the purpose set forth.

30,899.—F. W. Willard, of New York City, for an Improvement in Vapor Lamps:

I claim the combination of the plate, K, strip of metal, I, and the wire, J, constructed and operating for the purposes and uses substantially as set forth in the specification.

30,900.—J. J. Watson, of Buffalo, N. Y., for an Improvement in Tapping Gas and Water Pipe:

I claim, first, The employment of the wheel, B, provided with holes, D D E, and divided in two parts through its periphery, substantially as and for the purpose specified.

30,909.—Lysander Button and Robert Blake, of Waterford, N. Y., for an Improved Coupling for Hose Pipe:

I claim the folding handle lever or levers attached to a part or parts of such coupling forhose and pipes as require a rotary movement of said part or parts in the act of setting up, as set forth.

30,916.—E. F. M. Fletcher, of Georgia Plains, Vt., for an Improvement in Water Wheels:

I claim the combination of the two hemispherical hubs, D D, shaft B, concave and tapering buckets, d d, and springs E, the whole being constructed and arranged and operating in the manner and for the purposes set forth.

[This invention consists in the employment or use of wheels formed by having spiral buckets attached to central hubs, and also used in connection with the buckets springs so applied to the wheels as to regulate the capacity of the issues, according to the force or supply of water, so that the wheel will always work economically or, in other words, give out a maximum power of the head under varying heights of the same.]

30,924.—John Jameson, of Gateshead, England, for an improved Apparatus for Expanding and Compressing Elastic Fluids. Patented in England June 11th, 1860:

I claim the combination of the apparatus to produce those actions which I have called "borrowing and lending," with the apparatus for performing the functions of what I have called the "compressing apparatus," substantially as deicribed.

30,938 —S. M. Stone, of New Haven. Conn., for an Improved Means for Ventilating Buildings:

I claim the use of the pure air passage as A, in combination with the passage, E E, and smoke pipe, G, when the whole is constructed, arranged and fitted to produce the result as described.

30,947.—J. L. Mahan (assignor to D. Stuart and R. Peterson), of Philadelphia, Pa., for an Improvement in Gas Stoves:

I claim the inner chamber, D, diminishing in size towards its mouth, d, the outer chamber, c, the plain plate, F, the plate, m, of wire gauze, or its equivalent, and the hot air passage, i, when the said plain plate forms a continuation of the wire gauze, and when the whole of the above named parts are arranged, in respect to each other, as and for the purpose set forth.

30,952.—Levi Bissel, of North Bergen, N. Y., for an Improvement in Stove Pipes:

I claim the heads of the safe as constructed in combination with registers and inside pipes, g g, when said pipes are provided with ventilating holes, and all arranged as and for the purpose set forth.

30,960.—Jud Crissy, of Chatfield, Minn., for an Improvement in Water Wheels:

I claim, first, The employment or use with one or more wheels, D E, of a series of concentric gates or cylinders, constructed as described. and arranged relatively with the buckets, d, to operate as and for the purpose set forth.

Second, The arrangement of two wheels, D E, fitted in a frame or box, B, in a flume, or penstock, A, when provided on one and the same shaft, C, with consecutive cylinders or gates connected as shown, so that the gates of both wheels will be operated by adjusting the outer one of the upper wheel essentially as and for the purpose set forth.

[This invention has for its object the regulating of the capacity of the wheel according to the power required, so that any given power less than the maximum may be obtained with an economical expenditure of water; that is to say, a greater or less power may be obtained from one and the same wheel by a supply of water proportionate to the power required, a result which is not attained with the ordinary wheels, which depend solely on an ordinary gate to regulate the supply of water to them. In this case the wheels always require proportionately a greater volume of water when giving out a power less than the maximum.]

30,965.—J. S. Gray, of New York City, for an Improvement in Vapor Lamps:

I claim, The combination of the wick tube, C, bracket, D, conductors, E, and heater cap, F, when arranged for joint operation, substantially in the manner described for the purpose set forth.

30,971.—Nelson Johnson, of Jasper, N. Y., for an Improvement in Water Wheels:

I claim the inclined buckets, f, being of concave form in their horizontal section, and of gradually decreasing width from top to bottom, in connection with the inclined or beveled lower rim, h, essentially in the manner and for the purpose set forth.

[This invention relates to that class of water wheels which discharge the water at the center, and are commonly called center-vent wheels. The object of the invention is to obtain both the impact and the reacting force of the water in a way that will give a better result than any hitherto devised.]

30,977.—William Mallerd, of Bridgeport, Conn., for an Improved Gas Burner Regulator:

I claim making the inner tube, C, vertically adjustable in its socket, A, substantially as shown and described, so that the flow of gas through the orifices of said tube may be increased or diminished and thus regulated at pleasure, by raising or lowering the said tube so as to bring a greater or less number of the orifices above the head of the socket, all as set forth.

I also claim the arrangement of the escape orifices of said tube, C, or varying horizontal planes, as and for the purpose set forth.

I also claim the exterior graduation of said tube, C, as shown and described, so that the quantity of gas which issues through the orifices when the tube is set to any given hight, will be indicated to the eye, all as set forth.

30,996.—J. J. Watson, William Hardiker and Thomas Toye, of Buffalo, N. Y., for an Improved Apparatus for Ventilating and Warming Railroad Cars:

We claim the employment of the fans, D D, pipes, E and H, flues, P P, registers, F F, dampers, d and e, together with furnace, G, and air space, J, around said furnace arranged as set forth, for the purpose of supplying heat and for ventilating the car, substantially as is fully described.

WATER-METERS.

All our principal cities in the United States, which at present give, under civil authority, an unlimited freedom of use to water supply for domestic and manufacturing purposes, must very soon adopt, for the protection of all the important interests involved, a careful system of measurement, as a standard of charge, in place of the present imperfect and unjust method in vogue.

It is clear, without any argument at length, that the front, depth, height, or number of inmates of any dwelling, cannot be made a just criterion of the consumption and waste of water; nor in factories, using steam power, can the nominal horse power of boilers be taken, as an accurate measure of their consumption. Each case has its special controlling circumstances of use or wasteful neglect, and it is manifest that the only safe and satisfactory way to determine the question of use, and the consequent item of charge, lies in the general introduction of water meters.

Although all our Water-Boards annually express this opinion, in one way or another, and in certain instances avail themselves of one or another kind of patent meters, it is well understood that the chief hindrance to their universal adoption lies in the costly character of the several inventions hitherto made, where such inventions possess proper mechanical construction. For this reason, which has often presented itself to our notice, we offer the following suggestion to the inventive genius of our readers.

All the meters now in use, or proposed for use, are constructed with great delicacy in their working parts, to insure the greatest accuracy in measurement, and, as this nicety of register cannot be had without expensive workmanship, all these machines are costly.

We present the idea, therefore, that there is no use whatever in all this nicety of measurement, for all the purposes of general application in dwellings and factories; and that a safe *comparative* measurement of supply is equally just, as a standard of charge. If, for instance, all the dwellings in a given district are supplied with meters, which register within 15 to 20 per cent. of the actual quantity used, no one suffers wrong, or can be made to pay for the wastefulness of his neighbor, since the general average of consumption is determined from the same basis. And, for this reason, substantial meters which can be built of any uniform pattern, to register within 20 per cent., more or less, of the supply, are just as valuable as those which register within 2 per cent., for all ordinary uses. A very slight investigation of the argument which favors the use of meters at all, will show that a matter of 20 per cent., on actual consumption, might be properly ignored, in comparison with the rate of consumption actually paid for.

What our water works really need, then, is a plan of meter which can be furnished, for universal use, at a cost ranging between $5 and $10, and which will register within 20 per cent. of actual supply, without such complicated or delicate movements as will readily get out of order; and the person who produces such an invention is fully warranted in the hope of a better and more speedy fortune than usually awaits the devotees of the Great White Palace of Forlorn Hope at Washington.

As early as 1855, the average consumption of water, charged to the population of New York city, for a portion of the time embraced in an actual measurement, was 90·39 gallons per day for each person then rated in the census return. No householder will admit that this is a fair estimate of his own use, by three or fourfold; and yet the provident pay for the improvident, and will continue to do so, until each is charged for what he actually consumes and no more. The cost of the new reservoir is stated by the Croton Board at $1,000,000, and, when complete will only facilitate the waste instead of reducing it. Whereas, if the 45,000 consumers of the city had been supplied, in 1855, with meters averaging in cost $10 each, the city would have saved $550,000, and paid for them itself. The philosophy and necessity of these meters are clear; not so that of the new reservoir.

We urge this subject on the attention of mechanical men. It will pay.—*Am. Railway Review.*

THE LONDON TIMES IN A GEOGRAPHICAL FOG.—The *Times* has given us several able articles on the present condition of America; it understands our politics to a T, but when it comes to American geography, it is in an old-fashioned London fog. In its leader of Nov. 28, speaking of the President elect, it says:

Everybody migrates in America, and the early removals of the Lincoln family from Kentucky to Spencer County, from Spencer County to Illinois, from Illinois to Coles County, and from Coles County to Macon County, only typify the transplantations of American intellect, the constant breaking of new professional ground, and the uninterrupted succession of new positions and opportunities which convey the Mississippi boatman to the dignity of the White-House.

Now, for the information of the editor of the foreign department of the *Times*, we would say that he has made a regular *pot-pourri* of States and Counties of various States, evidently without the slightest idea of landmarks, and we inform him that Spencer County is in the State of Kentucky, while Coles and Macon Counties are in the State of Illinois. It is quite possible, though not probable, that Mr. Lincoln may have lived in more than one County in Illinois. His present residence is at Springfield, Sangamon County, State of Illinois. We will chatechise him on this subject and report in our next; meantime, in order to give effect to the article in the *Times*, it should read thus: "Everybody migrates in America, (the *Times* "blows fancy" here), and the early removals of the Lincoln family from Spencer County, in the State of Kentucky, to Coles County, thence to Macon County, and thence to Springfield, in Sangamon County, his present residence, the capital of the State of Illinois," &c., &c.

We refer the *Times* to *Lippincott's Pronouncing Gazetteer of the World* as a good geographical reference, and we will be most happy to present the editor with a copy if he will tell us how to send it on. It is about the size of a London Directory, but a good deal more in it worth knowing, if it is a Yankee book.

MISCELLANEOUS.

THE MECCA OIL WELLS.—There have been about two hundred wells sunk in the vicinity of Power's Corners and others are being commenced daily. Of these, fifty to seventy-five promise to be paying wells. Thirteen steam engines have been put in operation, pumping, and some eight or ten more are on the ground and will be in motion in a few days. Those already at work are owned by Bonnell, Jordan & Co., Reinhart & Donner, Dean & Co., T. M Abell & Co., Lowery & Co., Thompson & Duncan, Walbridge & Co., E Scoville, Skeels & Co., Pattengall & Co., Mills & Garrett, and McClure & Co. Some of these wells yield from 12 to 16 barrels per day, and some 5 to 10 barrels. It is probable that the average daily yield is almost six barrels of 40 gallons each, to each well, or about seventy-five barrels, or three thousand gallons per day in all. This amount is increasing every day, as new wells are being sunk, and improvements in the raising and separating apparatus are made. Quite a village is springing up at the Corners, and though it looks a little raw at present, we presume it will be thoroughly fried in oil sometime.—*Warren Chronicle.*

CLARIFYING COAL OILS.—Messrs. Dumoulin and Coutelle have been making a series of experiments with a view of rendering heavy oils suitable for ordinary lighting purposes, and have succeeded in producing a magnicent light, free from smoke and smell, and adapted in all respects for burning in a room. The following is their process:—In a close vessel are placed 100 lbs. of crude coal oil, 25 quarts of water, 1 lb. of chloride of lime, 1 lb. soda, and ½ a pound of oxide of manganese. The mixture is violently agitated, and allowed to rest for 24 hours, when the clear oil is decanted and distilled. The 1000 lbs. of coal oil are to be mixed with 25 lbs. of resin oil; this is one of the principal points in the manipulation, it removes the gummy parts from the oil and renders them inodorous. The distillation spoken of may terminate the process, or the oils may be distilled before they are defacated and precipitated.—*Le Genie Industriel.*

DEODORIZING THE THAMES.—In 1859, during three months very dry weather, old Father Thames—that once classic stream famous in historic verses of English poets of the last century—became a huge sewer, sending forth fœtid odors all over the British metropolis. A report recently presented on the subject contains the statement that £17,700 (about $88,000) worth of deodorizing material was thrown into the Thames during the months of June, July and August. The deodorizing agents employed were chiefly chloride of lime, of which 478 tons were used, and of chalk lime 4,280 tons were used. These were chiefly thrown into the sewers, and while the temperature of the river remained high—from 69° to 74°, the river remained proof against all efforts of deodorization. A great outlay has also been made this year to provide a sufficient supply of the perchloride of iron to modify the pungent powers of Father Thames' snuff-box.

COMPANA ESPANOLA DEL ALUMBRADO DE GAS.—This is the great Havana, Cuba, Gas-Light Company. The works were built by James Robb, of New Orleans, in 1845, and have lately been extended and improved. Mr. John F. Harrison, has lately resigned his position as Engineer, and is now in this city considering other propositions. These are coal gas-works, use 175 iron retorts, chiefly English, 2 station meters, and some 5,000 customer meters of the several manufactures of Samuel Down, Code, Hopper & Gratz, and Crosley & Co.; 1 gasholder of 400,000 feet, 1 of 180,000 feet, and 2 of 60,000 feet each, built by Neilson & Co., of Glasgow, Scotland, and Merrick & Sons, Philadelphia. Length of mains about 50 miles; lead joints; coal costs $7 50 per ton of 2,240 lbs. delivered at works; make 18 candle gas (so they say); made 148 millions of c. f. in 1859; charge no rent for meters, and purify by dry-lime.

COTTON SEED OIL.—From experiments made in manufacturing it appears that a ton of cotton seed yields about thirty-five or forty gallons of oil and 700 or 800 pounds of oil cake. The cake sells for about $40 per ton at the manufactory. Two kinds of oil are made, the variety depending upon the clarifying process used; the white selling for 80 cents per gallon and the yellow for 60 cents per gallon; the seeds cost from $11 to $13 per ton.

WATER-WORKS AT HONOLULU, S. I.—Honolulu is to be supplied with water, by the laying of iron pipes to a valley seven miles distant.

METROPOLITAN GAS COMPANY.—The works of this company are progressing on the land purchased by them on Forty-second street, South side, between Eleventh Avenue and the North River. The foundations of the Retort House and coal sheds are laid, and piles driven for the purifying house. The buildings appear to be quite substantial and sufficiently extensive for the purpose. The plans embrace all modern improvements in building and manufacturing.

DETROIT, MICH.—Builders of gas-works not stated. Use Belgian clay retorts, from Elliman Brothers, with Thomas Hoadley's. Iron retorts, from C. Kellogg, Detroit. Meters from Code, Hopper & Gratz. Gasholder built by J. W. & J. F. Starr. Pipe laid some 19 miles, from 3 to 10 inches. Ohio coal used, at $5 per 2000 lb. Made 25,000,000 cubic feet of gas last year.

DAYTON, O.—Gas-works built by John Jeffrey & Co.; iron retorts, from S. S. Asheraft; gasholder from George Stacey; station-meter, from Phenix Works, Baltimore; other meters, from Code, Hopper & Gratz, and Glover, of London; use the Youghiogheny coal, at 17 cents per bushel of 74½ lbs. Floating debt about $40,000, at 8 per cent. per annum.

FUEL from coal dust is largely manufactured in England by mixing with it some bituminous substance, so that it can be moulded into forms like bricks. In this country there is an immense quanty of coal dust thrown away, and so is the bituminous substance that might be used to mould it.

THE PHILADELPHIA GAS-WORKS SHORT OF COAL.—Owing to the inability to procure a sufficient number of cars on the Pennsylvania railroad, for the transportation of coal, the Philadelphia Gas-Works were obliged to come into this market last month for a supply of coal for immediate use. A supply was promptly offered by the Manhattan Gas Company, but before the arrangements were completed a supply arrived by railroad.

DRAINAGE IN TERREBONNE, LA.—The *Houma Cera* parish of Terrebonne, suggests a meeting of citizens to take steps for the improvement of the parish. The sum of $40,000 i said to have been idle in the State Treasury, that belongs to the Parish for drainage purposes. The proper appropriation of this is a matter worthy public action. The construction of a branch road to the New Orleans and Oupelousas is also suggested.

KITTANNING, PA., COAL GAS-WORKS, are being erected here under the name of the "Armstong Gas Company." The chartered capital is $50,000. Shares $25 each. Stock owned, principally, in this city. Price of gas will probably be $3 per 1000 c. f. Best gas coal costs there 3½ cents per bushel. The works will not probably be finished until spring. Edward S. Golden, President, John W. Rohrer, Secretary.

COMPANIA CUBANA.—This Company is located in Havana, and has erected gas-works in Cienfuegos, Guanabacoa, Regla and Trinidad, Cuba. Mr. Harrison was Engineer of it also. This Company is somewhat after the style of the Imperial Gas-Light Association of London, which, having a large capital builds gas-works over the continent of Europe. The Cienfuegos Gas Works use iron retorts and are in other respects similar to the gas-works at Trinidad, Regla and Guanabacoa, which last two have but very recently been finished.

CIRCUMNAVIGATION OF NEW YORK CITY.—Senator J. McLeod Murphy has made three surverys for a canal to connect the Hudson and East Rivers above New York. The best route, by Spuyten Duyvel Creek, has no elevation greater than 11 feet above Harlem river, is 3 800 feet long, and to give a canal of 10 feet depth and 75 feet width at bottom, would require the excavation of 188,500 cubic yards of earth and 35,500 cubic yards of rock.

LEXINGTON, KY.—Works built by John Jeffrey & Co., for coal gas, and have always worked well. Stacey and Riley built the gas-holders; use Bunsen's photometer, no exhauster; 5 miles mains; yarn and lead joints; Youghioheny coal at 20½ cents per 76 lbs., and Code, Hopper & Gratz's meters.

ZANESVILLE, O.—Coal Gas-Works built by John Lockwood, who built the Milwaukie, Wis. Works. Use Iron Retorts from Ambus & Co., Columbus, O.; and Keller's Belgian Retorts, from Elliman & Co., New-York; Thompson's gas-holders, of Cincinnati, O. Length of mains 10 miles, from 1½ to 6 inches. Coal costs 5 cents per bushel of 72 lbs.

LITTLE FALLS, N. Y.—Rosin Oil Works, built originally by Nason & Guild, of N. Y. city; have since been remodled and are quite satisfactory. The iron retorts were made by Michael Ready of Little Falls; meters by Samuel Down, and McDonald; gas-holders by Nason & Guild. Mains extend some 2 miles of 1½ to 5 inches diameter.

NEW ALBANY, IND.—Coal Gas-Works built by John Lockwood, (What has become of John Lockwood? we would like to hear from him,) and are very good. Iron retorts from Roach & Long, Louisville, Ky.; all the meters from Code, Hopper & Gartz; use Pittsburgh coal at 12½ cents per bushel of 76 lbs.; charge 20 to 50 cents per month for meters.

DOVER, DEL.—Gas-works built under the Aubin patent, by Charles N. Trump, of Philadelphia. Use rosin and Cannel. Works reported as very satisfactory. Bement & Dougherty furnished the iron retorts; McDonald & Co., the meters; George W. Kraft, the gasholder. Mix seven-eighths Kanawha coal, at $12 per ton, with one-eigth rosin. These works were built on private account, but were to have been chartered last winter.

COAL-OIL & CANDLES.

CANDLES FROM COAL.—Manufactured by the New York Paraffine Candle Co. Under Meucci's Patent. The above Company having recently made great improvement in their mode of manufacture, now offer to the public a Candle superior to any other in the market. They give a softer and more brilliant light and burn 6 hours to the pound longer than the best wax and sperm, and considering the strength of the light, are the most economical Candles in use.

CAUTION.

As unscrupulous persons are already offering imitations of these Candles, purchasers should bear in mind, that every box sold by this Company is stamped with the annexed trade mark, to counterfeit which is felony.

For sale by all first-class grocers, and to the trade by WM. E. RIDER,
General Agent of the Company,
16 Beekman Street, New York.

STANDARD Photometric Candles.—Owing to a number of Applications made to me for information concerning the supply of the "Standard Sperm Candles," used in Photometrics, I have obtained a supply, from which I can furnish those who require them with full directions for use. T. W. PARMELE,
No. 4 Irving Place, New York.

TO CANDLE AND SOAP Makers.—Processes with drawings to manufacture every kind of candles and soaps by different processes: Candles by distillation, saponification, French candles, common candles, hard and soft soaps, palm soaps; processes to bleach palm oil and make candles out of it; purification of tallow; essays on glasses and soaps. Address, Professor H. Dussauce, Chemist, New Lebanon, N. Y.

J. L. McREA, Dealer in Coal Oils and Lamps, Binnacle and Signal Light Oils, 139 Water street, New York.

Rosin Oil and Rosin.—For sale of our own manufacture a superior article of ROSIN OIL, for Gas purposes. Also Refined Oil. For shipment in secure iron-bound barrels, or by any single barrel.

Address MARYLAND GAS COMPANY, No. 6 Bank of Baltimore Building, Baltimore, Md.

P. S. This Company is also prepared to construct their superior Patented GAS WORKS of any capacity, from that required for a private dwelling, hotel, church, college or factory, to such as will supply cities and towns, complete in all their parts for the manufacture of GAS, from either Rosin Oil, Coal, or Rosin.

THE LUTHER ATWOOD OIL CO.—Manufacturers of Superior Illuminating, Machinery and Binacle Oils. Office, No. 34 Burling Slip, New York.

EMPIRE CITY CAMPHENE Works.—Aaron Seeley, Manufacturer and Distiller of camphene, alcohol, burning fluid, coal-oil, and dealer in naval stores, of every description. 32 and 34 Burling Slip, New York.

H. RYDER & CO., New Bedford, Mass.—Purchasers and Manufacturers of Semi-Crude Paraffine. Ryder's patent Paraffine Candles, manufactured and for sale.

NEW-BEDFORD OIL CO.—Office foot of South-st., New-Bedford, manufacture coal-oil for illuminating and lubricating purposes, of the best quality
ABRAHAM H. HOWLAND.
Our Coal Oil will burn in all Kerosene Lamps.

LUBRICATING COAL OIL. Crude Oil, and Paraffine.—Calvin Dickey, Manufacturer of Lubricating Coal Oil, free from odor and chemicals, and warranted to be as good for cotton and woolen machinery as lard oil. This oil is now also used by several rail roads in its pure state. Samples sent to responsible parties. Also 32° crude oil, which will yield 75 per cent of burning oil; and slack pressed Paraffine of superior quality. CALVIN DICKEY,
Newark, Ohio.

OLEOMETERS.

OLEOMETER, OR HYDROMETER. For Kerosene, Coal Oils, Petroleum and other Distilled Oils. Scale by Dr. Gesner. Manufactured and sold by
G. TAGLIABUE,
298 Pearl-st., New York.

PORTABLE GAS-WORKS.

THE AUBIN GAS-WORKS CO., No. 44 State street, Albany, N. Y., will refer parties wanting GAS-WORKS FOR VILLAGES to seventeen of their Village Works now in operation in the United States and the Canadas in *every one of which the profits of the company are ten per cent. and upwards, and yet good gas is furnished.* Agents wanted to extend the sale of the AUBIN PORTABLE GAS STOVE for dwellings, factories, &c., which will make 1000 feet of gas in five hours, and with greater simplicity, safety and economy, than any other known apparatus.

BUTLER'S PATENT PORTABLE ROSIN GAS-WORKS,
FOR
DWELLINGS, CHURCHES, COUNTRY VILLAGES
AS WELL AS FOR CONSUMERS IN LARGE CITIES.
JOHN BUTLER,
No. 112 Fulton-st. and 15 Henry-st.,
Brooklyn, N. Y.

FOR LIGHTING RAILROAD CARS AND STEAMBOATS WITH GAS.
The whole process of Filling the Gas-Holders of a Railway Train, requires but Three Minutes.
APPLY TO THE
NEW YORK CAR & STEAMBOAT GAS CO.,
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C. R. WOODWORTH,
Manufacturer of
PORTABLE GAS WORKS,
74 WALL STREET, New York City.

PORTABLE GAS WORKS.—S. T. McDOUGALL'S PATENT Portable Gas Works, for making Gas from Rosin, Rosin Oil, Coal Oil, Naptha, Grease, etc. These Works combine the latest improvements in gas making, and are guaranteed to be superior to any in market. They are made of all sizes, suitable for either country or city use. No county house is complete without its Gas Works. Gas Stoves of every description on hand and made to order. For sale by S. T. McDougall, 170 Center Street, New York.
Agents wanted in other cities to sell rights or machines.

GAS FOR THE COUNTRY.—C. WOOSTER, Manufacturer of Improved Portable Gas-Machines, for Villages, Public Institutions, Churches, Hotels, Railroad Depots, Factories, Mills, Machine-Shops, Plantation Dwellings, &c. Office, 256 Canal street, near Broadway.
This Machine has been in successful operation for years, in many of the best residences and factories in the country, and for simplicity of construction, ease of management and economy of light produced, possess advantages over all other machines for the purpose now in use. It is adapted to the making of Gas from Crude Rosin or Rosin-Oil, producing a Gas of twice the illuminating power of Coal-Gas, at about one half the price usually charged for that gas.
Every Machine is sold under a strict guarantee to operate according to representation, and no payment required until the fact is demonstrated by actual use.
For further particulars, and descriptive pamphlet containing references to numerous parties now using the apparatus, address
C. WOOSTER,
No. 256 Canal-st., near Broadway, N. Y.
For Engravings, see AMERICAN GAS-LIGHT JOURNAL, for June, 1860, page 245.
☞ Responsible Agents wanted, with whom liberal arrangements will be made.

APPLETON'S IMPROVED GAS-Works, for Factories, Hotels, Dwellings, and Towns. The most simple and economical works in use, furnishing a superior light to coal gas at a cost of one half a cent per burner per hour. It does not injure trees, or plate, and is not affected by cold. For Circular and Terms apply to APPLETON & GRAHAM,
56 Washington street, Boston.
For Engravings, see AMERICAN GAS-LIGHT JOURNAL for April, 1860, page 213.

ROSIN GAS-WORKS, for Factories, Hotels, and Public Buildings. These works may be seen in operation at the Berkshire Woolen Mills, Great Barrington, Mass.; Manchester Mills, Manchester, Ct.; A. A. Van Alen & Co's. Factories, Stuyvesant Falls, N.Y., and many other places JAMES O. MORSE & CO.,
76 John-st., New York.

MARSH'S PATENT ROSIN or Sun-Light Gas-Works, for Private Dwellings, Hotels, Factories, Railway stations, Sugar-Houses, Towns, &c. By the peculiar construction of the Retorts, the largest amount of decomposing surface is obtained in the smallest space. 2d. Gas is manufactured from crude rosin, without the least deposit of carbonaceous matter in the retorts or pipes: thus enabling them to be operated continuously, generating rapidly the best and cheapest illuminating gas obtained from this material. ALFRED MARSH & CO.,
241 Broadway, New York.

GASOMETER RIVETS.

PHILLIPS & ALLEN, Pennsylvania avenue, above 22d street, Philadelphia.—GASOMETER RIVETS of all kinds.

SCIENTIFIC BOOKS.

SCIENTIFIC BOOKS.—D. APPLETON & Co., 443 and 445 Broadway, have just published a Catalogue of their large assortment of Books (English and American) in every department of Science and Art, embracing a valuable collection of works on Geology, Chemistry, Mechanics, Engineering, the Naval and Military Sciences, and on Steam, Steam Engines, and Steam Navigation, etc., etc., etc., with the dates and prices of each work affixed.
Catalogues remitted to any address on receipt of six cents in P. O. stamps.

GAS ENGINEERS' LIBRARY.—A few works, indispensable to Engineers, Contractors and others engaged in the construction of Gas Works and manufacture of Gas, have been selected out of a large stock of chemical and other works, and are recommended to the attention of those interested. See page 208, vol. 11, of this JOURNAL.
For sale at the Rooms of the AMERICAN GAS LIGHT JOURNAL, New-York.

COAL OIL.—A Practical treatise on Coal, Petroleum, and other distilled Oils, by Abraham Gesner. 8vo., illustrated. Cloth, $1 50.
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ROOFING SLATES of the Eagle Slate Company, are of superior quality, low cost, fire-proof, yield pure and untainted rain water, and last a lifetime. Builders address the agent of the Company,
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PATENT ASPHALTE ROOFING and SHIP SHEATHING FELTS, the cheapest, best, and most durable ever offered to the public. Circulars, samples, &c., will be forwarded free. Agents wanted for city and towns. None genuine unless purchased of AARON A. DEGRAUW, 242 South street, our sole agent for the United States.
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CLAY RETORTS.

NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)
B. KREISCHER & CO., office 56 Goerck street, corner Delancy street, New York.
GAS-HOUSE TILES and FIRE BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND articles of every description made to order at the shortest notice. B. KREISCHER, M. MAURER, A. WEBER.

KENNEDY'S Method of Securing Iron Mouth-Pieces to Clay Retorts.—The Retort is made in the usual form, but without any bolt-holes through the flange. An iron collar in two pieces, is placed around the Retort behind the flange, and bolted to the mouth piece outside of the flange instead of through it.
For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 245. Address the Patentee, JOHN P. KENNEDY, Trenton, N. J.

WATER-GAS WORKS.

WATER-GAS.—APPLETON & GRAHAM,
AGENTS FOR THE
NEW ENGLAND WATER-GAS COMPANY,
UNDER THE SANDERS PATENT,
Are prepared to give estimates for Works, and guarantee the cost of Gas not to exceed One Dollar per 1000 cubic feet.
☞ Coal or Rosin Gas-Works altered at small expense.
A. & G. continue as heretofore to erect their improved Rosin and Rosin-Oil Works for Private Dwellings, Factories, &c. For further particulars apply at 56 WASHINGTON-ST., BOSTON.

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Gas-Works erected for Towns, Villages, Factories, and Dwellings.

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Consulting and Constructing GAS-ENGINEER. SAVANNAH, Geo.
REFERENCES:
CHARLES ROOME, Esq., Pres. Man. Gas Co., N. Y.
J. K. BRICK, Esq., Eng'r. Brooklyn Gas Co., "
Messrs. ELLIMAN BROTHERS, New-York.
F. T. WILLIS, ESQ., Pres. Savannah Gas Co.
J. A. SABBATON, Esq., Eng'r. Man. Gas Co., N. Y.
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SCAMMON'S GAS-APPARATUS for private residences, factories, hotels and cities. See engravings of Rosin and Coal Gas-Works in AMERICAN GAS-LIGHT JOURNAL for Dec. 1, 1860, pages 179 and 180.
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GASOMETERS, RETORT-HOUSE ROOFS, WATER-TANKS,
PURIFYING-BOXES, COAL-CARS, COKE BARROWS,
AND ALL KINDS OF
WROUGHT-IRON WORK FOR GAS AND WATER WORKS.
Manufactured by GEORGE W. KRAFT, Chestnut street wharf, West Philadelphia, Pa.

GEORGE STACEY, Cincinnati, O., Manufacturer of single and Telescopic Gasholders, Wrought-Iron Bridges, Girders, Joists and Stairways, Coke and Coal Wagons, Rakes, Screens, and other Gas-works tools, Slide and Cup Valves, Bolts, Nuts, Chizels, Ladles and other tools, Wrought-iron roofs, for Slate and Corrugated Iron, Gas Purifiers, Washers, Centre seal Valves and other Gas apparatus, Boiler-plate Retort Lids. Refer to—
Cincinnati Gas Light & Coke Co.
Nashville Gas-Light Co.
Springfield Gas-Light Co.
Columbus Gas-Light Co.
Cleveland Gas-Light Co.
Covington and Newport Gas Light Co.
Memphis Gas-Light Co.
Indianapolis Gas-Light and Coke Co.
James H. Caldwell, Esq., New Orleans.
John Jeffrey, Esq., Cincinnati.

POOLE & HUNT, Baltimore, Md., are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And all other Descriptions of
Iron Work for Gas-Works, Water-Pipes and Heavy Castings and Machinery Generally.

ANTI-FREEZING APPARATUS

FREEZING OF GAS-PIPES.—Walton's Patent Anti-Freezing Apparatus illustrated by engravings, in the AMERICAN GAS-LIGHT JOURNAL, of Jan. 1, 1861, page 212, is the most simple, durable and efficient of any known process.
See also certificates from Cincinnati, O., and Louisville, Ky. Gas-Works in same number, page 208. Address, JOHN WALTON.
Supt. Gas-Works, Louisville, Ky.

MISCELLANEOUS.

PHOTOMETER APPARATUS and Room for Sale.—The Room is about 6 feet wide by 12 feet long, painted black inside and screwed together. It can be taken down and boxed for transportation. All the pipes and fittings are complete for immediate use. Address PHOTOMETER, care of the AMERICAN GAS-LIGHT JOURNAL, 254 Canal Street, New York.

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MANUFACTURERS OF
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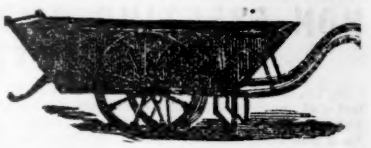


FURMAN-St., Near Fulton Ferry, Brooklyn, N. Y.

WOODEN TRAYS FOR GAS-PURIFIERS.—JOHN L. CHEESMAN, No. 147 Avenue C, near Tenth street, New-York, manufactures his Patent WOODEN TRAYS for GAS-PURIFIERS, *cut out of the solid wood*, superior to the ordinary iron plates, cheaper and more durable. The attention of Gas Companies and Engineers is called to this improvement, which has been adopted by the following Gas-Works:

Albany, N. Y.,	Manhattan, N. Y. City,
Chicago, Ill.,	Philadelphia, Penn.,
Williamsb'gh, N.Y.,	Worcester, Mass.

See Engravings on page 148, Vol. II.

OFFICIAL.—NOTICE TO MARINERS.—No. 104. Africa—Southeast Coast—Fixed White Light at mouth of Buffalo River.

TREASURY DEPARTMENT, Office of Light-House Board, Washington, Dec. 20, 1860.

Official information has been received at this Office that the Colonial Government at the Cape of Good Hope has given notice, that on and after the 25th day of August, 1860, a light would be exhibited from the light-house recently erected at the entrance of Buffalo River, East London, Southeast coast of Southern Africa.
The light is a *fixed white* light, elevated 45 feet above the level of high water, and visible in clear weather from a distance of about 11 miles.
The light-house—painted in alternate bands of red and white—stands on the reef at the south side of the entrance of the river.
R. SEMMES, Secretary.

GAS THERMOMETERS FOR ascertaining and regulating the temperature of the gas while passing through the purifiers into the station meters; for sale at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

GAS, STEAM, SMOKE,

PURE WATER & SOIL PIPE

FROM

JOSEPH CLIFF,

Wortley Fire-Brick Works, Leeds, Eng.

T. W. PARMELE, Agt.,

No. 4 Irving Place, N. Y.

ENAMEL DIALS FOR GAS AND WATER METERS

BOTTOMLEY & HINES, MANUFACTURERS, West Philadelphia, Pa.

The best, therefore the cheapest for Gas and Water Meters and Engineers' Indicators.

These Dials are particularly adapted to all purposes where gas, gas-vapors, or acids, are present. Also, Watch and Clock Dials of every description, from any size up to 14 inches diameter.

The undersigned embrace this opportunity of returning their thanks to the gas-meter manufacturers throughout the United States, for the very liberal patronage they have received for the past ten years, during which they have been established in Philadelphia, which has placed us ahead of all competition. Our sales for the past year have been far greater than we could have anticipated, with the prospects of a steady increase. Our constant aim has been, and will be, to adopt all improved processes of manufacture, combining improvement in quality with reduction in price. All Dials made by us are warranted to be as represented, and of the best materials and workmanship, which will recommend them to all parties wishing the very best. Circulars sent free by mail, or on application.

We are the appointed agents for HUNTER, SHEARMAN & CO.'S make of BRASS PINION-WIRE Gas-meters, which we believe is equal to the best.

STREET GAS-LANTERNS.

Cities and Gas Companies furnished at reasonable rates with Lanterns, Iron Frames, Grazed Complete or Separate. Also, Fancy Lanterns, for Hotels, Restaurants, Theatres, Telegraph Offices, Churches, and other Public Buildings. Having been in the business for many years I fully understand the manufacture of Gas Lanterns, and with the aid of machinery can make the parts cheaper than any other manufacturer. Orders from a distance solicited, and executed promptly.

A. C. PARRY,

31 Race Street, Cincinnati, Ohio.

JOHN RUSSELL & CO.,

PATENT TUBE MAKERS,

THE OLD TUBE WORKS, WEDNESBURY, AND THE ALMA WORKS, WALSAL, STAFFORDSHIRE

69 UPPER THAMES-ST., & 5 CHARLES-ST., SOHO, LONDON;

AND 35 GRANBY-ROW, MANCHESTER, ENGLAND.

The original Manufacturers of WROUGHT-IRON GAS TUBES, and the Inventors of the Lapwelded Tubes for Locomotive and Marine Boilers. All kinds of TUBES and FITTINGS, whether for Gas, Steam, or Water. Galvanized and Composition Tubes. Chandeliers, and every kind of Brass-work or Gas and Steam.

STOCKS, DIES, AND TAPS OF ALL SIZES. CAST IRON PIPE AND GAS-METERS.

ALL GOODS WARRANTED.

GENGEMBRE'S PATENT

NON-FREEZING AND NON-EVAPORATING

GAS-METER FLUID.

By the use of this Fluid, the WET GAS-METER of ordinary construction is rendered the most perfect and most reliable Gas-Measuring Instrument ever offered to Gas Companies. In winter the Meter will continue to work equally well, *however exposed it may be*; and in summer, the level of the Fluid remaining constant without refilling, the measurement of the Gas will be both uniform and constant.

The use of this Fluid is both easy and economical, and Gas Companies desirous of using it, will be licensed on liberal terms. For further particulars, and certificates of parties having used the same or over three years, and for city rights, apply to

A. DOISY, Box 1180,

General Agent and Attorney for GENGEMBRE'S PATENT.

N. B.—No Sales of Territorial right, or Licenses for using my Patent will be valid, without being ratified by my Signature, as I have no Agent authorized to execute the same.

H. P. GENGEMBRE, PATENTEE,

Box 48, Alleghany City, Penn.

PLUMBERS & GAS-FITTERS.

LOCKE & CRAIGIE, Plumbers and Gas-Fitters, No. 12 East 20th street, New York.

LOCKE, CRAIGIE & CO., Gas-Fittings, Chandeliers, Brackets, Globes, &c., No. 927 Broadway, New York.

☞ Particular attention paid to country work.

JAMES HELME, Chandelier and Gas-Fitting Establishment, No. 58, East Thirteenth street, between Broadway and University Place, New York.

BRADBURY M. JOHNSON, GAS-Fitter and Plumber, No. 111 East Eighteenth street, New York.

A large and elegant assortment of CHANDELIERS, BRACKETS, &c. Gas-Pipe and Posts made for Gas Companies on favorable terms.

M'KENZIE & O'HARA, Plumbers and Gas-Fitters, No. 326 FOURTH STREET, CORNER OF MERCER ST., NEW YORK.

Water Closet Pans, Wine Basins, Wash Basins, Sinks, Fountains, Jets for public and private purposes, Stop-cocks, Filters, and all other Water apparatus.

ALSO, a complete assortment of Gas-fixtures Pendants, Chandeliers, Brackets, &c. &c.

MISCELLANEOUS.

BURTIS' PATENT COMPENSATING COUNTERBALANCE FOR GASOMETERS.—This Improvement consists in making the attachment to the Gas-Holder by counterweights in such a manner as to effectually prevent it from getting out of level so as to bind, and also to prevent any escape of Gas at Cup or Hydraulic seal, where the Holder is on the Telescopic plan. Holders that work out of level, are thus evenly balanced, and prevented from binding or lodging against Tank-wall and falling down, thereby being rendered unfit for service. Where Holders or sections of Holders cannot be used on account of the above difficulties, this arrangement will remove them, and place the Holder in good working order; moreover, with this attachment, deep tanks are not necessary.

BURTIS' COUNTERBALANCE has been in use for three years at the Gas-Works, Chicago, Ill. Its resistance to high winds and snow-drifts, is alone sufficient to recommend its general adoption. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 221. Address

P. T. BURTIS,

Engineer Gas-Works, Chicago, Ill

HARPER & O'CONNELL, Manufacturers of Gas Shades and Globes of every description. FRENCH COLORED GAS SHADES AND SMOKE BELLS Nos. 63 and 65 Elizabeth street corner Hester, New York.

DRIP-PUMPS.

THE ILLUSTRATION on page 210 vol. 11, represents our new style of DRIP-PUMP, designed particularly for the use of Gas Companies and Plumbers. The Cylinder, Rod and Plunger, are made of Brass. Without doubt they are the best and cheapest articles in the market. Also, 150 varieties of Iron and Brass Lift and Force Pumps. ALSO, all sizes Fire-Engines, Hose, and Hose-Carriages, Hose-Carts, &c., &c. Address,

COWING & CO., Seneca Falls, N. Y.

IRON RETORTS.

CELLULAR GAS-RETORTS. C. M. CRESSON'S CELLULAR GAS Retorts, Patented October 3d, 1854. Adapted to the manufacture of GAS from Rosin, Coal, Wood, &c., and now in use at the Philadelphia Gas Works. Patent Rights for sale. For information apply to HENRY S. HAGERT, Attorney for Patentee, S. E. cor of Walnut and Sixth streets, Philadelphia, Pa.

FOR SYMMES' PATENT RE-torts, Mouthpieces, &c. address—

ELLIMAN BROTHERS, 217 Pearl-st., New York.
MORRIS, TASKER & CO, Philadelphia.
HORATIO EAGLE, 126 Maiden Lane, N. Y.
Or H. K. SYMMES, Newton, Mass.

See Engravings in AMERICAN GAS-LIGHT JOURNAL for July 1, 1860, page 280.

GAS LANTERNS.

A. & G. BRANDON, Manufacturers of Street and Fancy

LAMPS,

of every pattern, for Hotels, Saloons and Public Buildings, on hand and made order.

Cities, Villages, and Gas Companies supplied with Street Lamps, on favorable terms. Office, No. 4 TYRON Row, City Hall Square, and Manufactory, No. 102 Mulberry street, one door from Canal street, New-York.

Cast Iron Street Lanterns, neat and very durable.

For sale by JOHN JEFFREY, Cincinnati, Ohio

Street Lanterns cast in three pieces, which are fitted together without bolts, rivets, solder or other fastenings; glazed without tins, putty, or catches; the glass slipping into grooves cast in the lantern. These lanterns have been adopted, and are now used, by the City Councils of Cincinnati, O., Covington, Ky., and other cities.

HEATING APPARATUS.

STEAM & HOT WATER Heating.—We are prepared to Heat Public and Private Buildings with Hot Water or Steam, in the most substantial manner, at low prices. Estimates given for work in any part of the country, by RICHARDSON, BOYNTON & CO., No. 260 Canal-st., N. Y.

STEAM DOMESTICATED.—Low Pressure Steam for Domestic Warming, an Apparatus which is simple, durable, economical, and perfectly safe. Estimates given and work done in any part of the country.

Descriptive pamphlets furnished on application to BAKER, SMITH & CO.,

Sole manufacturers, Nos. 180 and 182 Centre street, N. Y.

GEORGE L. CANNON, Successor to the Rippowam Co., 54 East 13th street, between Broadway and University Place manufacturer and dealer in Air, Water, and Steam Warming and Ventilating Apparatus, Cooking Ranges, Range Furniture, Registers, Ventilators, &c.

Particular attention given to Heating Churches, School Houses, Public Buildings &c.

HOT WATER GAS-STOVES, Manufactured by HUNTER, KELLER & Co., 144 Centre-st., New York.

See Engravings on page 163, Vol. II., of this JOURNAL.

WATER HOSE.

LEATHER HOSE, for Fire Engines, Steamboats, Factories, Street Washers, &c., manufactured from the best oak-tanned leather, with wrought-copper rivets, always on hand and for sale by

STEPHEN S. VANDERHOFF,

Late John H. Bowle & Co., 25 Ferry-st., N. Y.

CANVAS WATER HOSE—Woven whole and coated on the inner side—a new article, equal to leather even for Fire Engines, where it has been thoroughly tested, costing about one half. For sale in lots to suit purchasers, of all sizes, by

FOX & POLHEMUS, 59 Broad st., cor. Beaver.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies, For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam stops.

HENRY R. WORTHINGTON, 28 Broadway, N. Y.

BURNELL'S PATENT ROTARY PUMP, adapted to all purposes of Pumping, from the well and cisterns to the steam fire-engine. The most simple, durable and efficient Pump yet made.

Principal sales depot at No. 22 Platt street, New York. SAMUEL B. LEACH.

GAS-BURNERS.

T. G. ARNOLD, Manufacturer of Gas Burners, Mercury Cups, Portable Sockets, Burner Pillars, &c., No. 447 Broome street (second door west of Broadway), New-York. Imported Scotch Tips and Burner Pliers always on hand

FRD. C. KRAUSE, Manufacturer of Patent Porous Gas-Burners for COOKING, IRONING, HEATING, CHEMICAL APPARATUS, &c., No. 772 Eighth Avenue, corner of Fifty-Fourth street, New York.

Sole Agent for the United States,

HORATIO EAGLE, 126 Maiden Lane, N. Y.

SCHWARZ'S PATENT STEA-tite, or Lava Gas-Burner Tips.—These obtained a Gold Prize Medal in Europe, where they are now extensively used in place of metal tips. In Prof. Liebig's and other Chemists' works, these burners are recommended as *indestructible by acids or alkalies, unchangeable by heat or cold, not liable to rust or corrosion*, and superior in economy to the metal tips. Boston and other cities have adopted them for street lights after a satisfactory trial. They are imported from Germany by the undersigned, sole Agent for America, who can now supply the trade or cities at reduced prices, with any pattern of tips to fit the double cylinder or other kind of burners. For sale also, Large Gas Heating Burners, of same material, for Chemists, &c. W. W. WARREN, 25 Kilby-st., Boston

ORNE'S PATENT FILTER-REG-ULATING GAS BURNER, admitted by all practical and scientific men, who have examined its movements, to be

THE BEST GAS BURNER YET INVENTED.

They are self-regulating, gas-purifying indestructible, and most economical.

For sale by S. A. STETSON & CO., 350 Washington-st., Boston.
And by HORATIO EAGLE, 126 Maiden Lane, New-York.

See Engravings in Nov. 1, 1860, page 144.

PATENT GAS-BURNERS.—Jas. McGLENSEY, No. 111 South Eighth streeet, PHILADELPHIA, Manufacturer of Gas-Burners, Meters, &c., respectfully calls the attention of Book-Binders, Chemists, Druggists, Copperplate Printers, Brush-Makers, Case and Cabinet-Makers, Hotels and Restaurants, to his Patent Gas-Stove Heating Apparatus, as being particularlarly adapted to their wants—preventing all soiling and injury to the vessels or substances heated, is entirely free from smoke or smell, and highly economical. He refers to the following persons, who have the Apparatus in use:

BULLOCK & CRESHAW, Nos. 103 & 105 N. 6th-st.
T. S. WIEGAND, Chemist, 15th & Race-st.
F. A. GENTHO, Analytical, 33 Walnut-st
JOS. LIPPINCOTT, Book-Binder, cor. 4th and Commerce-sts.

PERFECTION.—This recent Improvement in Gas-Burners, embraces the great economy of the Hicks Patent Burner, a gain of over 75 per cent. in light. This Burner is now offered to the Trade and all consumers of gas, at the price of the common burner. It is anti-corrosive, gives a uniform and beautifully-shaped blaze, under any pressure, and will not get out of order.

It has been adopted by the Manhattan and Brooklyn, N. Y., Gas-Light Cos., for street lamps.

Samples will be sent to each Gas Co., in the United States, if requested.

Address L. E. HICKS,

335 Broadway, New York.

GAS-FIXTURES.

TIFFANY & COMPANY, Jewelers and Importers of elegant artistic PARIS GAS CHANDELIERS, BRACKETS, PENDANTS, &c., in Bronze and Gilt.

No. 550 BROADWAY, NEW YORK.

PHILADELPHIA GAS FIXTURE Works.—Warner, Miskey & Merrill, Manufacturers, Store, No. 718 Chestnut street, Philadelphia. Warner, Peck & Co., No. 376 Broadway, New York, would respectfully inform the public that they continue to Manufacture all kinds of Gas Fixtures, Lamps, Girandoles, Bronzes, &c., and that their large and varied stock comprises the simplest as well as the most elaborate patterns, designed by their French artists. They also continue to keep at their store, 376 Broadway, a large and full assortment of all their manufactured Goods. Dealers and others are invited to call and examine.

GAS FIXTURES TO BE SOLD at Wholesale Prices.—In consequence of alterations in his store, the Subscriber is obliged to dispose of his enire stock of Gas Fixtures. Those wishing to purchase at very low prices will do well to call. Gas Fixtures removed. Gas fitting executed in all its branches.

J. H. VAN REED,

219 Bleecker-st., N. Y.

Gas Fixtures and Fittings. RINGUET-LEPRINCE & L. MARCOTTE, Warehouse, 347 Fourth street.—Manufactory, 55 West Sixteenth street, New York.

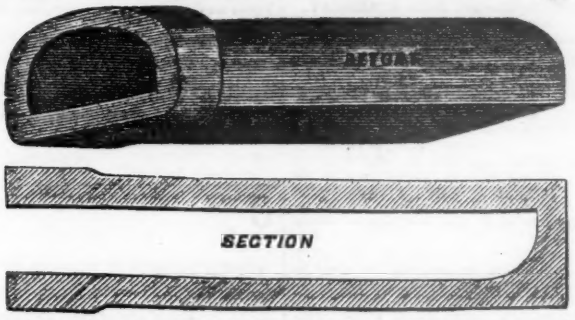
RINGUET-LEPRINCE, 3 Rue de la Paix, Paris.

Painting, Paneling, Cabinet Work, Looking-Glass Plates, Mirror Frames, Silk, Worsted and Woolen Materials, Aubusson and Moquette Carpets, Gas Fixtures, Bronzes &c.

GEORGE H. KITCHEN & CO., Manufacturers of Fixtures for Gas Light purposes, Wood's Building, No. 561 Broadway, New York. Office of the Inspector of Gas Meters for the State of New York.

KING BROTHERS,

STOURBRIDGE, ENGLAND, FIRE-BRICK AND RETORT WORKS.



KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning thus rendering them

FREE FROM CRACKS AND CORRECT IN FORM.

By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABBITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

EVERY RETORT AND BRICK IS BRANDED "KING BROTHERS, STOURBRIDGE."

HARRIS & PEARSON,

PROPRIETORS OF

BEST GLASS-HOUSE POT, AND CRUCIBLE CLAY.

Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.

AMBLECOTE FIRE-CLAY AND BRICK WORKS, STOURBRIDGE, ENGLAND.

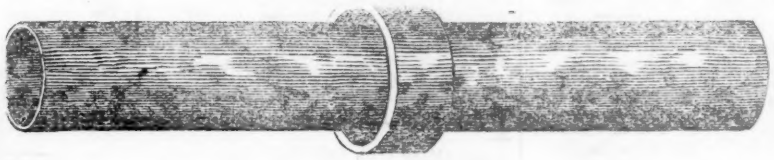
CODE, HOPPER & GRATZ,

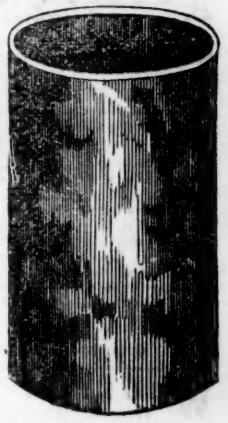
1500, 1502 and 1504 FILBERT-St., PHILADELPHIA.

MANUFACTURERS OF

Pressure Registers, Pressure Indicators, Pressure Gauges, Photometers, Governors, Station Meters, Customer Meters, (Wet and Dry,) Experimenta Meters, (Wet and Dry,) Show Meters, (Wet and Dry,) Meter Provers, Centre Seals, &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensive addition to our Factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with dispatch, and in all cases *Guarantee Entire satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction; we therefore recommend it, believing itsuperior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter-Inspector, and sealed when desired.





D. E. HILL,

MIDDLEBURY, SUMMIT CO., OHIO,

MANUFACTURER OF

SEWER-PIPES,

IN ALL ITS FORMS OF

Branches, Junctions, Curves, Elbows, Stench-Traps, &c., &c.

WARRANTED EQUAL TO THE BEST ENGLISH PIPE.

THE

STERLING GAS-REGULATOR

Improves the Light, and Saves a Large per centage of Gas.

MANUFACTURED BY THE

WHEELER & WILSON SEWING-MACHINE COMPANY.

It is well known that Printers require the best and most brilliant light. In proof of the superiority of these Machines over all others, the following New York establishments are using them, and testify to their excellence:—New-York Times, New-York Herald, New-York World, New-York Tribune, New-York Sun, Journal of Commerce, Courier & Enquirer, Evening Post, The Zeitung, Dispatch, Leader, Scientific American, Advertiser and Spectator, Independent, Daily News, Harper's Monthly and Weekly, Transcript, Mercury, Atlas, Life Illustrated, Albion, Spirit of the Times, AMERICAN GAS-LIGHT JOURNAL, Christian Enquirer, Churchman, Church Journal, Christian Advocate, Christian Ambassador, Christian Intelligencer, Observer, Sunday Times, Sunday Courier.

By order of the New York and Brooklyn Common Councils, these Regulators are now used in the City Halls, Police Stations, Markets, and other Public Buildings in both cities.

They are Warranted by the

WHEELER & WILSON SEWING-MACHINE CO.,

505 BROADWAY, NEW-YORK,

To keep in order, and always maintain the pressure of the Gas at the lowest point for a brilliant light, and economical combustion. They are so constructed that *under no circumstances can the Mercury get into the Meters, or in any way injure them.*

KIDDER'S

GAS-REGULATOR!!!

25 PER CENT. SAVED.

CERTIFIED BY SCIENTIFIC MEN TO BE THE

ONLY RELIABLE GAS-REGULATOR.

The undersigned Sole Agent for the sale of this valuable REGULATOR, is prepared to supply the Trade upon very favorable terms.

Agents Wanted in the Principal Cities and Towns throughout the United States and the British Possessions in North America.

As a Regulator and Economizer of Gas, it has received the highest testimonials. See advertisement in AMERICAN GAS-LIGHT JOURNAL, Vol. 2, No. 20, page 128.

HORATIO EAGLE, 126 Maiden Lane,

Between Pearl and Water streets.

CLAY RETORTS.

CLAY RETORTS.—J. K. BRICK & Co.—Brooklyn Clay Retort and Fire-Brick Works. Van Dyke, near Van Brunt street, Brooklyn, N. Y.—Manufacturers of Clay Retorts, Fire Brick, Gas and Hot House Tiles, Arch, Furnace and Cupola Brick, Fire Cement, Mortar, &c.

J. K. B. & Co. would invite the attention of Gas Companies to the important fact, that the Clay Retorts manufactured at their Works can be set without Tiles, requiring to be supported only at the front and rear ends, thereby exposing the entire surface of the Retort to the direct action of the flame from the furnace.

The results of this mode of setting, are a Saving of Fuel, Tiles, Transportation of Materials, Labor and Space, thereby enabling Gas Companies to set Retorts of at least 50 per cent. greater capacity than those usually employed in the ordinary arches.

ENGLISH FIRE BRICKS, Rufford's Stourbridge Bricks, Stourbridge and Welsh Clay.
S. THOMPSON'S Neph., Imp'r,
45 Gold-st.

ELLIMAN BROTHERS, 217 Pearl-St., New York, Commission Merchants, Importers of
BELGIAN FIRE-CLAY GAS RETORTS,
Dealers in Tiles, Arch-Bricks, Furnace-Doors, Mouth-Pieces, Covers,
and all other Fittings, of the most approved patterns, for setting Clay Retorts.
Sabbaton's Patent Furnace-Doors, & Frames,
Floyd's Patent Malleable Iron Retort Covers,
McKenzie's Patent Gas-Exhausters,
made by Addison Smith. Compensator-Valves, &c.
Gas, Water, and Steam Tubes

GAUTIER'S CLAY RETORTS.— Fire and Arch Bricks. Gas-House Tiles, &c. Black Lead Crucibles for Steel Works and Brass Founders.
MANY, BALDWIN & MANY, 49 John-st., N. Y.

PHILADELPHIA FIRE-BRICK Works, corner of Vine and Twenty-third streets, Philadelphia.
JOHN NEWKUMET,
Manufacturer of all kinds of Fire-Brick, Gas-House Tiles, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice

PATENT PYRO-CLAY GAS RETORTS. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-engineers to these Retorts, as a very superior article.
References:—Gas-Light Works, Buffalo, N. Y.
" " Cleveland, O.
" " Chicago, Ill.
THOS. HOADLEY 34 Front st., Cleveland, O.

ADDISON POTTER,
Willington Quay,
Near Newcastle-upon-Tyne, England,
Manufacturer of Clay Retorts, Fire Bricks, and every description of Fire Clay goods.

COWEN'S PATENT FIRE-CLAY Retorts.
JOSEPH COWEN & Co., Blaydon Burn, near Newcastle-on-Tyne, England, were the only parties to whom a Prize Medal was awarded at the Great Exhibition in London, of 1851, for "Gas Retorts and Other Objects in Fire Clay."
J. C. & Co. have been for many years the most extensive manufacturers of Fire Clay Retorts in the United Kingdom; and orders for Fire Clay Retorts of all shapes and dimensions, Fire Bricks, and every other article in Fire Clay, are promptly executed at their works as above.
COWEN'S GARESFIELD COAL AND COKE.
Coal and Coke office,
Quay Side, Newcastle-on-Tyne.

WILLIAM RYDER, General Mineral and Metal Agent and Merchant, 4 Dean street, Newcastle-on-Tyne, England, is prepared to supply Gas Companies and others with every variety of appliance for the production and supply of Gas, including Gasometers, Retorts (metal and clay), Fire Bricks, Coals, Metal Mains, Tubes, in wrought iron, copper, brass, lead or composition, Meters, Taps, Fittings, &c., &c.; and from his extensive experience in this class of work, can guarantee every thing of the best description.

JOHN ROGERSON & CO., New-Castle on-Tyne, Middlesbro'-on-Tees, London, supply Gas Coal, Clay Retorts, Cast Iron Pipes and Retorts, Gasometers, &c. A partner of the above house being now in this city, will be glad to wait upon any gas company requiring supplies. Agents, MEAD & BELL,
17 William street, New York.

CLIFF'S ENGLISH CLAY RETORTS
Retort-Covers, Gas-Exhausters, Furnace Doors, Castings Implements, Photometrical and Meter-Proving Apparatus.
T. W. PARMELE, Sole Agent,
No. 4 Irving Place, New-York.

FINANCIAL.

GAS-LIGHT STOCKS FOR SALE. THREE HUNDRED THOUSAND DOLLARS of Stocks in various Gas-light Companies in the United States, paying from 6 to 12 per cent dividend, for sale by JOHN B. MURRAY, Rooms of the American Gas-Light Journal, N. Y.

STREET DEPARTMENT.—Times Building, No. 39 Park Row. To contractors. Proposals enclosed in a sealed envelope, endorsed with the title of the work and with the name of the bidder written thereon, will be received at this office until 12½ o'clock, P. M., of Thursday, January 24, 1861, for repairing and reglazing the public lamps for one year, in accordance with the specifications prepared therefor. Proposals must be directed to the Street Commissioner, who reserves the right to reject all the estimates offered if he deems it for the interests of the Corporation Bidders are required to write out the amount of their bids, in addition to inserting the same in figures. Blank forms of proposals, together with the specifications and the agreements can be obtained at this office. Dated Street Department, New York, January 12, 1861.
G. W. SMITH, Street Commissioner.

STOP-COCKS, &C.

DANIEL THOMPSON, Machinist and manufacturer of Stop Cocks, Fire Plugs, &c., for Water-Works, Stop Cocks, Valves, Drip Pumps, &c., for Gas-Works, No. 133, Elfreth Alley, Philadelphia.

CARDS.

NATIONAL DIRECTORY
OF
Gas & Steam Fitters & Plumbers.

ALBANY, N. Y.
WILLIAM MUNSIG, **623 Broadway.**
ALEX. B. SHEPARD, **17 South Pearl St.**

BALTIMORE, MD.
BLAIR & CO., **366 W. Baltm'e St.**
GRATTAN & EVANS, **8 North St.**
J. H. McCALL & CO., **15 W. Fayette St.**
JOHN RICHARDS, **374 W. Baltm'e St.**

BOSTON, MASS.
J. KENNEDY, **45 Maverick Sq.**
W. WILTSHIRE, **46 Devonshire St.**
N. P. WOODMAN, **13 Haverhill St.**
J. B. WRIGHT, **28 Devonshire St.**

CINCINNATI, O.
BAKER & VON PUHL, **64 Fourth St.**

NEW YORK.
JAMES HELME, **59 East 13th St.**
WM. TOWERS, **31 Carmine St.**
GEO. C. ELLISON, **859 Broadway.**
B. M. JOHNSON, **111 East 18th St.**
LOCKE & CRAIGIE, **13 East 20th St.**
McKENZIE & O'HARA, **326 Fourth St.**
ANTHONY KENDALL, **258 W. 36th St.**
DAVIS B. LANE, **167 William St.**
F. B. LANGWITH, **62 White St**
FRANCIS MATTHEWS, **47 Ann Street.**
CHAS. F. MERRITT, **156 Seventh Ave.**
WM. PALMER, **408 Eighth Ave.**
GEORGE E. PARKER, **156 Seventh Ave.**
DAVID REA, **48 Cortlandt St.**

GAS-METER FLUID.

FLUID for GAS METERS.—The undersigned is prepared to furnish the Glycerine meter fluid in quantities to suit purchasers: *It does not evaporate, can be made to stand any degree of cold liable to occur in this country or in Canada, and does not corrode the metals of the meter. It has been in use successfully for the last three years.*
For particulars, references, &c., address the manufacturer. HENRY BOWER,
Box 363, Philadelphia, Pa.
For sale also by HORATIO EAGLE, sole Agent for the cities of New York, Brookyn and Jersey city.

GENGEMBRE'S PATENT GAS-Meter Fluid. It is non-freezing and non-evaporating. Certificates from several companies that have used it may be found in the American Gas-Light Journal for December 1st, 1860, page 163. For Sale only by
A. L. BOGART, 592 Broadway, New York.

TO CONTRACTORS.

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